

حمل الآن

مجانا وحصريا

المراجعة رقم (1)

الترم الثاني



First Algebra

Q1: Choose the correct answer

1 The point of intersection of the two straight lines: $x + 3 = 0$ and $y = 5$ is

- (a) (3, 5) (b) (-3, 5) (c) (-3, -5) (d) (3, -5)

2 The point of intersection of the two straight lines : $x + 2 = 0$, $y = x$ is

- (a) (2, 2) (b) (2, 0) (c) (-2, -2) (d) (0, 0)

3 The S.S of the two equations: $x - 2y = 1$, $3x + y = 10$ in $R \times R$ is

- (a) {(5, 2)} (b) {(2, 4)} (c) {(1, 3)} (d) {(3, 1)}

4 The number of solutions of the equation : $y - 2 = \text{zero}$ in $R \times R$ is

- (a) 0 (b) 1 (c) 2 (d) infinite

5 The ordered pair which satisfies each of the two equations: $xy = 2$, $x - y = 1$ is

- (a) (1, 1) (b) (2, 1) (c) (1, 2) (d) $(\frac{1}{2}, 1)$

6 The number of solutions of the two equations: $x + y = 2$, $2y + 2x = 5$ in $R \times R$ is

- (a) 0 (b) 1 (c) 2 (d) infinite

7 The S.S of the two equations : $x - y = 0$, $xy = 9$ in $R \times R$ is

- (a) {(0, 0)} (b) {(-3, 3)} (c) {(3, 3)} (d) {(-3, -3), (3, 3)}

8 The two straight lines: $x + y = 5$, $2x + 2y = 7$ are

- (a) parallel (b) coincident
(c) intersecting and not perpendicular (d) perpendicular



9 The two straight lines: $3x = 7$, $2y = 9$ are

- (a) parallel (b) coincident
(c) intersecting and not perpendicular (d) perpendicular

10 The number of solutions of the two equations : $x + 2y = 5$, $x - 2y = -1$ in $R \times R$ is

- (a) 0 (b) 1 (c) 2 (d) infinite

11 If $ab = 3$, $ab^2 = 12$, then $b =$

- (a) 4 (b) 2 (c) -2 (d) ± 2

12 One of the solutions of the two equations: $x - y = 2$, $x^2 + y^2 = 20$ in $R \times R$ is

- (a) (1, 3) (b) (2, 0) (c) (4, 2) (d) (-4, 2)

13 If the S.S of the equation: $x^2 - ax + 4 = 0$ in R is $\{2\}$, then $a =$

- (a) -4 (b) 2 (c) -2 (d) 4

14 The solution set of the two equations: $x + y = 0$ and $y - 5 = 0$ in $R \times R$ is

- (a) $\{(-5, 5)\}$ (b) $\{(5, -5)\}$ (c) $\{(5, 5)\}$ (d) $\{(-5, -5)\}$

15 If the two straight lines : $x - 3y = 2$, $x + ky = 5$ are parallel, then $k =$

- (a) 2 (b) 5 (c) -3 (d) 3

16 If there are an infinite number of solutions of the two equations: $x + 4y = 7$, $3x + ky = 21$, then $k =$

- (a) 4 (b) 7 (c) 12 (d) 21

17 The number of solutions of the two equations: $x + 2y = 3$, $2x + 4y + 6 = 0$ in $R \times R$ is

- (a) a unique solution (b) two solutions
(c) an infinite number of solutions (d) zero



18 The two straight lines : $x + 3y = 4$, $3y + x = 1$ are

- (a) parallel (b) coincident
(c) intersecting and not perpendicular (d) perpendicular

19 If the two straight lines representing the two equations : $x + 3y = 4$, $x + ay = 7$ are parallel, then $a = \dots\dots\dots$

- (a) 3 (b) 4 (c) 7 (d) 11

20 If the two equations $2x + 3y = 7$, $4x + ky = 14$ has infinite number of solutions in $R \times R$, then $k = \dots\dots\dots$

- (a) 7 (b) 4 (c) 6 (d) 21

21 In the equation: $ax^2 + bx + c = 0$ where $a \neq 0$. If $b^2 - 4ac < 0$ then number of the equation roots in $R = \dots\dots\dots$

- (a) 0 (b) 1 (c) 2 (d) infinite number

22 In the equation: $ax^2 + bx + c = 0$ where $a \neq 0$, if $b^2 - 4ac > 0$, then this equation has roots in R .

- (a) 1 (b) 2 (c) zero (d) an infinite number

23 If $x = 3$ is one of the solutions of the equation: $x^2 - ax - 6 = 0$, then $a = \dots\dots\dots$

- (a) 1 (b) 2 (c) 3 (d) -1

24 The two straight lines: $3x + 5y = 0$, $5x - 3y = 0$ are intersecting at

- (a) the origin point (b) the fourth quadrant
(c) the first quadrant (d) an infinite number of solution

25 The number of solutions of a 1st degree equation in two variables equals of solutions

- (a) Zero (b) 1 (c) 3 (d) Infinite



26 The solution set of the two equations: $x + 3y = 4$, $3y + x = 1$ in $\mathbb{R} \times \mathbb{R}$ is

- (a) $\emptyset$ (b) $\{(1, 1)\}$ (c) $\{(0, \frac{1}{3})\}$ (d) $\{(0, 0)\}$

27 The two straight lines: $x - 3 = 0$, $y = 4$ are intersecting in the quadrant.

- (a) first (b) second (c) third (d) fourth

28 The number of solutions of the two equations: $x + y = 2$, $y + x = 3$ in $\mathbb{R} \times \mathbb{R}$ is

- (a) 0 (b) 1 (c) 2 (d) 3

29 If the two equations $3x + 2y = 9$, $6x + ky = 18$ has infinite number of solutions in $\mathbb{R} \times \mathbb{R}$, then $k = \dots\dots$

- (a) 6 (b) 4 (c) 8 (d) 7

30 If the curve of the quadratic function f touch the x -axis at the point $(k + 1, k - 2)$, then $k = \dots\dots$

- (a) 0 (b) 1 (c) 2 (d) 3

31 In the equation: $ax^2 + bx + c = 0$ where $a \neq 0$. If $b^2 - 4ac = 0$ then number of the equation roots in $\mathbb{R} = \dots$

- (a) 0 (b) 1 (c) 2 (d) infinite number

32 If the curve of the quadratic function f passes through the points $(-1, 0)$, $(0, -4)$ and $(4, 0)$, then the solution set of the equation $f(x) = 0$ in $\mathbb{R}$ is

- (a) $\{-1, 0\}$ (b) $\{-4, 0\}$ (c) $\{-1, 4\}$ (d) $\{4, -4\}$

33 The solution set of the two equations $x - y = 0$, $xy = 4$ in $\mathbb{R}\mathbb{R}$ is

- (a) $\{(2, 2)\}$ (b) $\{(-2, 2)\}$ (c) $\{(0, 0)\}$ (d) $\{(-2, -2), (2, 2)\}$



Q2: Answer The Following

- 1 Find the values of a and b, noting that: (3, -1) A solution to the two equations:

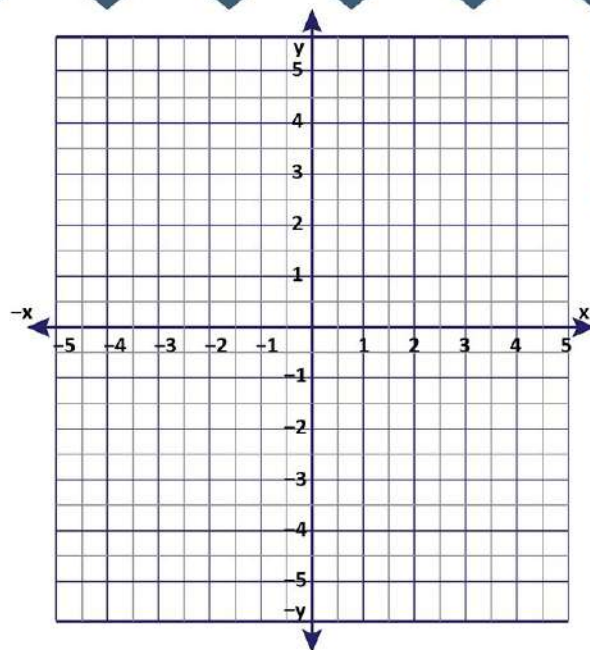
$$ax + by = 5 \quad , \quad 3ax + by = 17$$

- 2 A rectangle whose length exceeds its width by 4 cm, if the perimeter of the rectangle is 28 cm. Find the area of the rectangle.

- 3 Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the following two equations algebraically: $x - y = 0$, $x^2 + xy + y^2 = 27$

- 4 Two acute angles in a right-angled triangle, the difference between their measures is 50° , Find the measure of each angle





5 Graph the function $f: f(x) = x^2 - 4x + 3$ in the interval $[-1, 5]$ and from the graph, find :

- a The minimum value of the function.
- b The equation of the axis of symmetry
- c The S.S of the equation $f(x) = 0$

6 Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the following two equations algebraically:

$$x - y = 2 \quad , \quad x^2 + y^2 = 34$$

7 If the curve of the quadratic function f passes through the points $(-1, 0)$, $(0, -4)$ and $(4, 0)$ find the solution set of the equation: $f(x) = 0$

8 Find in $\mathbb{R}$ the solution set of the following equation using the general rule:

$$3x^2 + 1 = 6x \text{ (Approximating the result to one decimal place) .}$$



- 9 A right-angled triangle of hypotenuse length 13 cm, and its perimeter is 30 cm.
Find the lengths of the other two side

- 10 Find in R the S.S of equation using the general formula:
 $x(x - 1) = 4$ in R "to the nearest one decimal place"

- 11 Find in $R \times R$ the solution set of the two equations: $2x - y = 3$, $x + 2y = 4$

- 12 Find in $R \times R$ the solution set of the two equations: $y + 2x = 0$, $xy = 8$

- 13 Find in R the S.S of equation using the general formula: $x^2 - 2x - 6 = 0$ in R
"to the nearest one decimal place"



14 Find in $\mathbb{R}$ the solution set of the following equation using the general rule:

$$x^2 - 5x = -2 \text{ (Approximating the result to two decimal places)}$$

15 Two positive real numbers the difference between them is 6 and the product is 16.
Find the two numbers

16 A two-digit number its units digit twice the tens digit. If the product of its digits equals half of the original number, what is the number?

17 Find in $\mathbb{R}$ the S.S of equation using the general formula: $x^2 + 3x - 3 = 0$ in $\mathbb{R}$
"to the nearest one decimal place"

18 Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the following two equations: $x + y = 5$, $x^2 + y^2 = 13$



$$(x+y)^2 = (x-y)^2$$



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$$a^m / a^n = a^{m-n}$$

$$c^2 = a^2 + b^2$$

$$c^2 = a^2 + b^2$$

- 19 Two real numbers their sum is 10 and the difference between their squares is 40.
Find the two numbers.

- 20 Find in R the S.S of each equation using the general formula: $x^2 - x = 4$ in R
"to the nearest one decimal place"

- 21 The sum of two real numbers is 9 and the difference between their
squares equals 45. Find the two numbers.



Q1: Choose the correct answer

- 1 The set of zeroes of the function $f: f(x) = -3x$ is
 (a) $\{0\}$ (b) $\{-3\}$ (c) $\{-3, 0\}$ (d) $\mathbb{R}$
- 2 The set of zeroes of the function $f: f(x) = \text{zero}$ is
 (a) $\emptyset$ (b) $\mathbb{R} - \{0\}$ (c) $\{0\}$ (d) $\mathbb{R}$
- 3 If $z(f) = \{2\}$, $f(x) = x^3 - m$, then $m =$
 (a) $\sqrt[3]{2}$ (b) 2 (c) 4 (d) 8
- 4 The set of zeroes of the function $f: f(x) = \frac{2-x}{7}$ is
 (a) $\emptyset$ (b) $\{2\}$ (c) $\{2, 7\}$ (d) $\{7\}$
- 5 The set of zeroes of the function $f: f(x) = \frac{x^2-9}{x-2}$ is
 (a) $\{2\}$ (b) $\mathbb{R} - \{2\}$ (c) $\{3, -3\}$ (d) $\{3, -3, 2\}$
- 6 If $x = 3$ is one of the zeroes of the function $f: f(x) = \frac{x^2-2x+k}{x^2-25}$, then $k =$
 (a) 3 (b) 6 (c) -3 (d) -6
- 7 The common domain of the two fraction $\frac{2}{x^2-1}, \frac{5x}{x^2-x}$ is
 (a) $\mathbb{R} - \{1\}$ (b) $\mathbb{R} - \{0, 1\}$ (c) $\mathbb{R} - \{0, 1, -1\}$ (d) $\mathbb{R} - \{1, -1\}$
- 8 The common domain of the two fraction $\frac{2x}{x-3}, \frac{x}{x+5}$ is
 (a) $\{3, -5\}$ (b) $\mathbb{R} - \{0, 3, -5\}$ (c) $\mathbb{R} - \{3, -5\}$ (d) $\mathbb{R}$
- 9 The set of zeroes of the function $f: f(x) = x^2 + 1$ is
 (a) $\emptyset$ (b) $\{-1\}$ (c) $\{-1, 1\}$ (d) $\{0\}$



10 The domain of the function $f: f(x) = \frac{x-7}{3(x-3)}$ is

- (a) $\mathbb{R} - \{-1\}$ (b) $\mathbb{R} - \{3\}$ (c) $\mathbb{R} - \{-1, 3\}$ (d) $\mathbb{R}$

11 The common domain of the two fraction $\frac{x}{x+1}$, $\frac{x+2}{x^2+4}$ is

- (a) $\{-1\}$ (b) $\{-1, -4\}$ (c) $\mathbb{R} - \{-1\}$ (d) $\{-1, 2, -2\}$

12 If $x \neq 0$, then $\frac{5x}{x^2+1} \div \frac{x}{x^2+1} = \dots\dots\dots$

- (a) 1 (b) -1 (c) -5 (d) 5

13 If $\{2\}$ is the set of zeroes of the function $f: f(x) = x^3 - m$, then $m = \dots\dots\dots$

- (a) 8 (b) 6 (c) 4 (d) 2

14 If $n(x) = \frac{x}{x^2+9}$, then the domain of n^{-1} is

- (a) $\emptyset$ (b) $\mathbb{R} - \{-3, 3, 0\}$ (c) $\mathbb{R}$ (d) $\mathbb{R} - \{0\}$

15 If $n(x) = \frac{x^2-2x}{(x-2)(x^2+2)}$, then the domain of n^{-1} is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{2\}$ (c) $\mathbb{R} - \{0, 2\}$ (d) $\mathbb{R} - \{0\}$

16 The domain of the multiplicative inverse of the algebraic fraction $\frac{x-2}{x^3+27}$ is

- (a) $\mathbb{R} - \{2\}$ (b) $\mathbb{R} - \{-3, 2\}$ (c) $\mathbb{R} - \{2, -3, 3\}$ (d) $\mathbb{R} - \{-3, 3\}$

17 If $x \in \mathbb{R} - \{0, 1\}$, then $\frac{1-x}{x} \div \frac{x-1}{x}$ in simplest form is

- (a) 1 (b) -1 (c) $x-1$ (d) x

18 If $n_1(x) = \frac{x^2-4}{x-3}$, $n_2(x) = x+3$, then $n_1 = n_2$ when they have the same domain which is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{3\}$ (c) $\mathbb{R} - \{-3\}$ (d) $\mathbb{R} - \{1\}$



19 The algebraic fraction $\frac{1}{x}$ equals the algebraic fraction where $x \neq 0$

(a) $\frac{x}{x^2}$

(b) $\frac{1}{x^2}$

(c) $\frac{x}{2}$

(d) $\frac{x+1}{x}$

20 The set of zeroes of the function f where $f(x) = x(x^2 - 2x + 1)$ is

(a) $\{0, 1\}$

(b) $\{0, -1\}$

(c) $\{0\}$

(d) $\{1\}$

21 The additive inverse of the algebraic fraction $\frac{2}{x-1}$ is, where $x \neq 0$

(a) $\frac{-2}{x+1}$

(b) $\frac{x-1}{2}$

(c) $\frac{2}{1-x}$

(d) $\frac{-2}{-x+1}$

22 The set of zeroes of the function $f: f(x) = x^2 + 25$ is

(a) $\emptyset$

(b) $\{5\}$

(c) $\{5, -5\}$

(d) $\mathbb{R}$

23 The set of zeroes of f where $f(x) = \frac{x^2 - 3x + 2}{x - 2}$ is

(a) $\{2\}$

(b) $\{1\}$

(c) $\mathbb{R} - \{2\}$

(d) $\{1, 2\}$

24 If: 3 is one of the zeros of the function $f(x) = x^2 - 3x + m$, then m is

(a) 0

(b) 6

(c) 3

(d) -6

25 The additive inverse of the fraction $\frac{x+1}{x-5}$ is

(a) $\frac{x+1}{5-x}$

(b) $\frac{1-x}{x-5}$

(c) $\frac{1-x}{5-x}$

(d) $\frac{1-x}{x+5}$

26 If $n(x) = \frac{1}{(x^2 - 4)^2}$, then the domain of n^{-1} is

(a) $\mathbb{R} - \{1, 4\}$

(b) $\mathbb{R} - \{2, -2\}$

(c) $\mathbb{R} - \{1\}$

(d) $\mathbb{R}$

27 If $n(x) = \frac{x-2}{x+1}$, then the domain of n^{-1} is

(a) $\mathbb{R} - \{-1\}$

(b) $\mathbb{R} - \{2\}$

(c) $\mathbb{R} - \{1, -2\}$

(d) $\mathbb{R} - \{-1, 2\}$



Q2: Answer The Following

- 1 If the set of zeroes of the function $f: f(x) = \frac{x^2 - ax + 16}{x + b}$, is $\{4\}$ and its domain is $\mathbb{R} - \{2\}$, find the value of each of a and b

- 2 Find $n(x)$ in the simplest form, showing the domain of n where:

$$n(x) = \frac{3x}{x^2 - x - 2} + \frac{x - 1}{1 - x^2}$$

- 3 If $n_1(x) = \frac{2x}{2x + 8}$, $n_2(x) = \frac{x^2 + 4x}{x^2 + 8x + 16}$, prove that: $n_1 = n_2$

- 4 If the set of zeroes of the function $f: f(x) = \frac{x^2 - ax + 9}{bx + 4}$, is $\{3\}$ and its domain is $\mathbb{R} - \{2\}$

Find: the value of each of a and b



5 If $n(x) = \frac{x^2 + cx + 12}{x^2 + 3x + a}$, the domain of $n = \mathbb{R} - \{3, b\}$, $n(4) = 6$

Find the values of a , b and c

6 Find $n(x)$ in the simplest form, showing the domain of n :

$$n(x) = \frac{x^3 - 8}{x^2 + x - 6} \div \frac{x^2 + 2x + 4}{x + 3}$$

7 Find in the simplest form, showing the domain: $n(x) = \frac{x^3 - 8}{x^2 - 9} \times \frac{x + 3}{x^2 + 2x + 4}$

8 Find $n(x)$ in the simplest form, showing the domain of n where:

$$n(x) = \frac{3x - 6}{x^2 - 4} - \frac{9}{2 - x - x^2}, \text{ Find: } n(1) \text{ if possible.}$$



9 Find in the simplest form, showing the domain: $n(x) = \frac{x^2 + 2x + 4}{x^3 - 8} + \frac{x^2 - 2x - 3}{x^2 - 5x + 6}$

10 Find $n(x)$ in the simplest form, showing the domain where:

$$n(x) = \frac{x^2 - 4}{x^2 - 5x + 6} - \frac{5}{x - 3}$$

11 Find $n(x)$ in its simplest form, showing the domain of n where :

$$n(x) = \frac{x^2 + 2x}{x^3 - 27} \div \frac{x + 2}{x^2 + 3x + 9}$$

12 If $f: f(x) = \frac{x^2 + k}{x^2 - mx + 6}$, its domain is $\mathbb{R} - \{2, 3\}$, $f(4) = 9$,

Find: m, k



13) If the domain of $n(x) = \frac{b}{x} + \frac{9}{x+a}$, $R - \{0, 4\}$, $n(5) = 2$.

Find the value of a and b

14) If $n(x) = \frac{x^2 - 5x}{x^2 - 6x + 5}$, find $n_1(x)$ in the simplest form, showing the domain of n^{-1}

15) Find $n(x)$ in the simplest form, showing the domain of n :

$$n(x) = \frac{2x+6}{x^2+x-6} - \frac{x^2-6x}{x^2-8x+12}$$

16) Find in the simplest form, showing the domain: $n(x) = \frac{x^2 - x - 6}{x^2 - 4} \times \frac{x^2 - 2x}{x - 3}$



17 If $n_1(x) = \frac{x^2 - 4}{x^2 + x - 6}$, $n_2(x) = \frac{x^2 - x - 6}{x^2 - 9}$ are $n_1 = n_2$ or not why?

18 If the domain of the function n where $n(x) = \frac{x - 1}{x^2 - ax + 9}$ is $\mathbb{R} - \{3\}$ find the value of a

19 If $n(x) = \frac{x + 2}{x^2 - x - 6}$, find $n^{-1}(x)$ in the simplest form showing its domain.

Find: $n^{-1}(x) = 2$, what is the value of x

20 Find $n(x)$ in the simplest form, showing the domain of n where:

$$n(x) = \frac{x - 3}{x^2 - 7x + 12} - \frac{x - 3}{3 - x}$$



21 Find in the simplest form, showing the domain: $n(x) = \frac{x^2 - 12x + 36}{x^2 - 6x} \times \frac{4x + 24}{x^2 - 36}$

22 Find in the simplest form, showing the domain: $n(x) = \frac{x^2 - 3x + 2}{x^2 - 1} \div \frac{3x - 15}{x^2 - 6x + 5}$

23 If $n(x) = \frac{x^2 + 4x + 3}{x^3 + 27}$, find $n^{-1}(x)$ in the simplest form showing its domain.



Follow for More!

Q1: Choose the correct answer

1 If A , B are two mutually exclusive events from the sample space of a random experiment, then $P(A \cap B) = \dots\dots\dots$.

- (a) zero (b) 1 (c) $\frac{1}{2}$ (d) -1

2 If $P(A) = 4 P(A^c)$, then $P(A) = \dots\dots\dots$.

- (a) 0.6 (b) 0.4 (c) 0.2 (d) 0.8

3 If $A \subset B$, then $P(A \cup B) = \dots\dots\dots$.

- (a) $P(A)$ (b) $P(B)$ (c) 1 (d) $P(A \cap B)$

4 If A and B are two mutually exclusive events of a sample space of a random experiment, then $P(A - B) = \dots\dots\dots$

- (a) $P(A)$ (b) $P(B)$ (c) $P(A^c)$ (d) $P(B^c)$

5 The probability of the certain event equals

- (a) zero (b) 1 (c) $\frac{1}{2}$ (d) $\emptyset$

6 If A and B are two events from the sample space of a random experiment , $P(A) = 0.6$ and $P(A \cap B) = 0.4$, then $P(A - B) = \dots\dots\dots$.

- (a) 0.6 (b) 0.4 (c) 0.2 (d) 0.1

7 If A is an event of the sample space (S) of a random experiment and $P(A^c) = P(A)$, then $P(A) = \dots\dots\dots$.

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) 1



8 In an experiment of throwing a fair die once, the probability of appearing a prime number is

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{3}{4}$

9 The probability of the impossible event is

- (a) zero (b) 1 (c) $\frac{1}{2}$ (d) $\emptyset$

10 If a fair die is rolled once , then the probability of appearing a number less than or equal 3 equals

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{1}{6}$

11 If A and B are two events of a sample space S, $A \subset B$, then $P(A \cup B) = \dots\dots\dots$

- (a) $P(A)$ (b) $P(B)$ (c) $P(A \cap B)$ (d) 0

12 If $\bar{A}$ is the complementary event of A in the sample space of a random experiment, Then $P(\bar{A} \cup A) = \dots\dots\dots$

- (a) S (b) 1 (c) $\frac{1}{2}$ (d) $\emptyset$

13 If the probability of the failure of a student is 0.2, then the probability of his success is

- (a) 8 (b) 1 (c) $\frac{1}{5}$ (d) $\frac{4}{5}$

14 If $A \subset B$, then $P(A - B) = \dots\dots\dots$

- (a) $P(A)$ (b) $P(B)$ (c) zero (d) 1

15 If $A \subset S$ of a random experiment and $P(\bar{A}) = 2 P(A)$, then $P(A) = \dots\dots\dots$

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) 1



16) If A is an event from the sample space of a random experiment, then $P(A^c) = \dots\dots\dots$

- a) $P(A) - 1$ b) $1 - P(A)$ c) -1 d) 1

17) If $A \subset B$, then $P(A \cap B) = \dots\dots\dots$

- a) $P(A)$ b) $P(B)$ c) zero d) $\emptyset$

18) If A is an event from the sample space of a random experiment, and $P(A) = P(A^c)$, then $P(A) = \dots\dots\dots$

- a) 1 b) 0.25 c) 0.5 d) 2

19) If A is an event from the sample space of a random experiment, and $P(A) = 3P(A^c)$, then $P(A) = \dots\dots\dots$

- a) $\frac{1}{4}$ b) $\frac{3}{4}$ c) $\frac{1}{2}$ d) 1



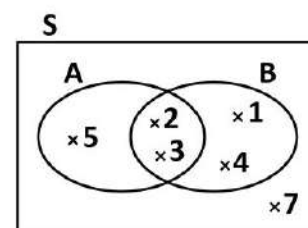
Q2: Answer The Following

- 1 If A , B are two events of the sample space of a random experiment and $P(A) = 0.3$, $P(B) = P(B^c)$, $P(A \cap B) = 0.2$

Find: **a** $P(A \cup B)$

b $P(A - B)$

- 2 If the opposite figure represents the two events A and B in the sample space (S) of a random experiment, Find:



a $P(A \cap B)$

b $P(A \cup B)$

c $P(A - B)$

- 3 If A , B are two events in the sample space of a random experiment:

$P(A) = 0.4$, $P(B) = 0.7$, $P(A \cup B) = 0.8$

Find: **a** $P(A \cap B)$

b $P(A - B)$

- 4 If A , B are two events of the sample space of a random experiment , $P(A) = 0.8$, $P(B) = 0.7$, $P(A \cap B) = 0.6$

Find: **a** $P(A \cup B)$

b The probability of non occurrence of A



5 If A , B are two events of the sample space of a random experiment and $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, Find $P(A \cup B)$ in each of the following two cases:

a) If $P(A \cap B) = \frac{1}{8}$

b) If A and B are two mutually exclusive events.

6 A bag contains 20 identical cards numbered from 1 to 20. A card is randomly drawn. Find the probability that the number on the drawn card is :

a) divisible by 3

b) divisible by 3 or 5

7 If A and B are two events of the sample space of a random experiment , $P(A) = 0.3$, $P(B) = 0.6$, Find $P(A \cup B)$ in each of the following cases:

a) A and B are mutually exclusive events

b) $P(A \cap B) = 0.2$

8 If A and B are two events of the sample space of a random experiment , $P(B) = \frac{1}{3}$, $P(A - B) = \frac{1}{4}$, Find $P(A)$ if:

a) $P(A \cap B) = \frac{1}{12}$

b) $B \subset A$



- 9 If A and B are two events from the sample space of a random experiment ,
 $P(A) = 0.5$, $P(A \cup B) = 0.8$ and $P(B) = 2x$, then calculate the value of x if :

- (a) $A \subset C$ (b) $P(A \cap B) = 0.1$

- 10 A bag contains 20 identical cards numbered from 1 to 20. One card is drawn randomly. Find the probability that the number on the drawn card:

- (a) Is divisible by 5 (b) Is odd and divisible by 5

- 11 If A and B are mutually exclusive events in the sample space of a random experiment and: $P(A) = 0.3$, $P(B) = 0.4$, find: $P(A \cup B)$, $P(A - B)$.



First Algebra

Q1: Choose the correct answer

1 The point of intersection of the two straight lines: $x + 3 = 0$ and $y = 5$ is

- (a) (3, 5) (b) (-3, 5) (c) (-3, -5) (d) (3, -5)

2 The point of intersection of the two straight lines : $x + 2 = 0$, $y = x$ is

- (a) (2, 2) (b) (2, 0) (c) (-2, -2) (d) (0, 0)

3 The S.S of the two equations: $x - 2y = 1$, $3x + y = 10$ in $R \times R$ is

- (a) {(5, 2)} (b) {(2, 4)} (c) {(1, 3)} (d) {(3, 1)}

4 The number of solutions of the equation : $y - 2 = \text{zero}$ in $R \times R$ is

- (a) 0 (b) 1 (c) 2 (d) infinite

5 The ordered pair which satisfies each of the two equations: $xy = 2$, $x - y = 1$ is

- (a) (1, 1) (b) (2, 1) (c) (1, 2) (d) $(\frac{1}{2}, 1)$

6 The number of solutions of the two equations: $x + y = 2$, $2y + 2x = 5$ in $R \times R$ is

- (a) 0 (b) 1 (c) 2 (d) infinite

7 The S.S of the two equations : $x - y = 0$, $xy = 9$ in $R \times R$ is

- (a) {(0, 0)} (b) {(-3, 3)} (c) {(3, 3)} (d) {(-3, -3), (3, 3)}

8 The two straight lines: $x + y = 5$, $2x + 2y = 7$ are

- (a) parallel (b) coincident
(c) intersecting and not perpendicular (d) perpendicular



9 The two straight lines: $3x = 7$, $2y = 9$ are

- (a) parallel (b) coincident
(c) intersecting and not perpendicular (d) perpendicular

10 The number of solutions of the two equations : $x + 2y = 5$, $x - 2y = -1$ in $R \times R$ is

- (a) 0 (b) 1 (c) 2 (d) infinite

11 If $ab = 3$, $ab^2 = 12$, then $b =$

- (a) 4 (b) 2 (c) -2 (d) ± 2

12 One of the solutions of the two equations: $x - y = 2$, $x^2 + y^2 = 20$ in $R \times R$ is

- (a) (1, 3) (b) (2, 0) (c) (4, 2) (d) (-4, 2)

13 If the S.S of the equation: $x^2 - ax + 4 = 0$ in R is $\{2\}$, then $a =$

- (a) -4 (b) 2 (c) -2 (d) 4

14 The solution set of the two equations: $x + y = 0$ and $y - 5 = 0$ in $R \times R$ is

- (a) $\{(-5, 5)\}$ (b) $\{(5, -5)\}$ (c) $\{(5, 5)\}$ (d) $\{(-5, -5)\}$

15 If the two straight lines : $x - 3y = 2$, $x + ky = 5$ are parallel, then $k =$

- (a) 2 (b) 5 (c) -3 (d) 3

16 If there are an infinite number of solutions of the two equations: $x + 4y = 7$, $3x + ky = 21$, then $k =$

- (a) 4 (b) 7 (c) 12 (d) 21

17 The number of solutions of the two equations: $x + 2y = 3$, $2x + 4y + 6 = 0$ in $R \times R$ is

- (a) a unique solution (b) two solutions
(c) an infinite number of solutions (d) zero



18 The two straight lines : $x + 3y = 4$, $3y + x = 1$ are

- ☒ a parallel ☐ b coincident
☐ c intersecting and not perpendicular ☐ d perpendicular

19 If the two straight lines representing the two equations : $x + 3y = 4$, $x + ay = 7$ are parallel, then $a = \dots\dots\dots$

- ☒ a 3 ☐ b 4 ☐ c 7 ☐ d 11

20 If the two equations $2x + 3y = 7$, $4x + ky = 14$ has infinite number of solutions in $R \times R$, then $k = \dots\dots\dots$

- ☐ a 7 ☐ b 4 ☒ c 6 ☐ d 21

21 In the equation: $ax^2 + bx + c = 0$ where $a \neq 0$. If $b^2 - 4ac < 0$ then number of the equation roots in $R = \dots\dots\dots$

- ☒ a 0 ☐ b 1 ☐ c 2 ☐ d infinite number

22 In the equation: $ax^2 + bx + c = 0$ where $a \neq 0$, if $b^2 - 4ac > 0$, then this equation has roots in R .

- ☐ a 1 ☒ b 2 ☐ c zero ☐ d an infinite number

23 If $x = 3$ is one of the solutions of the equation: $x^2 - ax - 6 = 0$, then $a = \dots\dots\dots$

- ☒ a 1 ☐ b 2 ☐ c 3 ☐ d -1

24 The two straight lines: $3x + 5y = 0$, $5x - 3y = 0$ are intersecting at

- ☒ a the origin point ☐ b the fourth quadrant
☐ c the first quadrant ☐ d an infinite number of solution

25 The number of solutions of a 1st degree equation in two variables equals of solutions

- ☐ a Zero ☐ b 1 ☐ c 3 ☒ d Infinite



26 The solution set of the two equations: $x + 3y = 4$, $3y + x = 1$ in $\mathbb{R} \times \mathbb{R}$ is

☒ a $\emptyset$

☐ b $\{(1, 1)\}$

☐ c $\{(0, \frac{1}{3})\}$

☐ d $\{(0, 0)\}$

27 The two straight lines: $x - 3 = 0$, $y = 4$ are intersecting in the quadrant.

☒ a first

☐ b second

☐ c third

☐ d fourth

28 The number of solutions of the two equations: $x + y = 2$, $y + x = 3$ in $\mathbb{R} \times \mathbb{R}$ is

☒ a 0

☐ b 1

☐ c 2

☐ d 3

29 If the two equations $3x + 2y = 9$, $6x + ky = 18$ has infinite number of solutions in $\mathbb{R} \times \mathbb{R}$, then $k = \dots\dots$

☐ a 6

☒ b 4

☐ c 8

☐ d 7

30 If the curve of the quadratic function f touch the x -axis at the point $(k + 1, k - 2)$, then $k = \dots\dots$

☐ a 0

☐ b 1

☒ c 2

☐ d 3

31 In the equation: $ax^2 + bx + c = 0$ where $a \neq 0$. If $b^2 - 4ac = 0$ then number of the equation roots in $\mathbb{R} = \dots$

☐ a 0

☒ b 1

☐ c 2

☐ d infinite number

32 If the curve of the quadratic function f passes through the points $(-1, 0)$, $(0, -4)$ and $(4, 0)$, then the solution set of the equation $f(x) = 0$ in $\mathbb{R}$ is

☐ a $\{-1, 0\}$

☐ b $\{-4, 0\}$

☒ c $\{-1, 4\}$

☐ d $\{4, -4\}$

33 The solution set of the two equations $x - y = 0$, $xy = 4$ in $\mathbb{R}\mathbb{R}$ is

☐ a $\{(2, 2)\}$

☐ b $\{(-2, 2)\}$

☐ c $\{(0, 0)\}$

☒ d $\{(-2, -2), (2, 2)\}$



Q2: Answer The Following

- 1 Find the values of a and b, noting that: (3, -1) A solution to the two equations:

$$ax + by = 5 \quad , \quad 3ax + by = 17$$

$$a = 2$$

$$b = 1$$

- 2 A rectangle whose length exceeds its width by 4 cm, if the perimeter of the rectangle is 28 cm. Find the area of the rectangle.

$$\text{Area} = 45 \text{ cm}^2$$

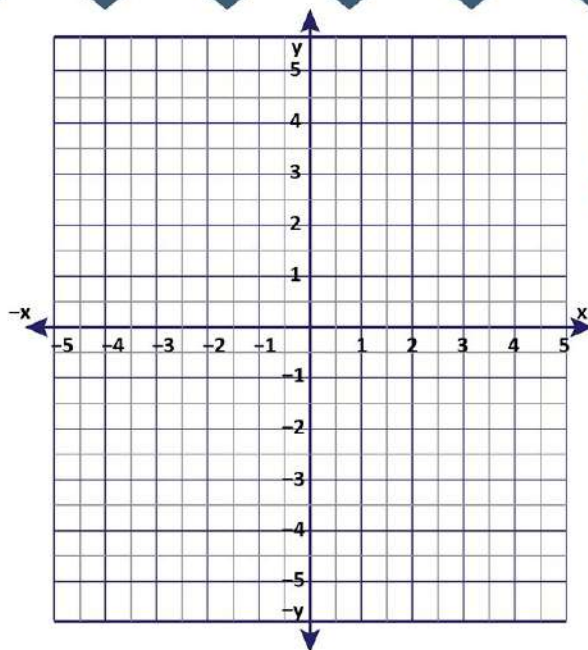
- 3 Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the following two equations algebraically: $x - y = 0$, $x^2 + xy + y^2 = 27$

$$\{(-3, -3), (3, 3)\}$$

- 4 Two acute angles in a right-angled triangle, the difference between their measures is 50° , Find the measure of each angle

$$\text{The measures of the angles are } 70 \text{ and } 20$$





5 Graph the function $f: f(x) = x^2 - 4x + 3$ in the interval $[-1, 5]$ and from the graph, find :

- a The minimum value of the function. **-1**
- b The equation of the axis of symmetry **$x = 2$**
- c The S.S of the equation $f(x) = 0$ **S.S = {1,3}**

6 Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the following two equations algebraically:

$$x - y = 2 \quad , \quad x^2 + y^2 = 34$$

$\{(-3, -5), (5, 3)\}$

7 If the curve of the quadratic function f passes through the points $(-1, 0)$, $(0, -4)$ and $(4, 0)$ find the solution set of the equation: $f(x) = 0$

S.S = $\{-1, 3\}$

8 Find in $\mathbb{R}$ the solution set of the following equation using the general rule:

$$3x^2 + 1 = 6x \text{ (Approximating the result to one decimal place) .}$$

S.S = $\{1.8, 0.2\}$



$$(x+y)^2 = (x-y)^2$$



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$$\frac{a^m}{a^n} = a^{m-n}$$

$$c^2 = a^2 + b^2$$

$$c^2 = a^2 + b^2$$

- 9 A right-angled triangle of hypotenuse length 13 cm, and its perimeter is 30 cm. Find the lengths of the other two side

The lengths of the other two sides are 12 cm and 5 cm.

- 10 Find in $\mathbb{R}$ the S.S of equation using the general formula:
 $x(x - 1) = 4$ in $\mathbb{R}$ "to the nearest one decimal place"

S.S = {2.6 , -1.6}

- 11 Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations: $2x - y = 3$, $x + 2y = 4$

S.S = {(2 , 1)}

- 12 Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations: $y + 2x = 0$, $xy = 8$

$\emptyset$

- 13 Find in $\mathbb{R}$ the S.S of equation using the general formula: $x^2 - 2x - 6 = 0$ in $\mathbb{R}$
 "to the nearest one decimal place"

S.S = {3.6 , -1.6}



- 14 Find in $\mathbb{R}$ the solution set of the following equation using the general rule:
 $x^2 - 5x = -2$ (Approximating the result to two decimal places)

S.S = {4.56 , 0.44}

- 15 Two positive real numbers the difference between them is 6 and the product is 16.
 Find the two numbers

The numbers are 8 and 2

- 16 A two-digit number its units digit twice the tens digit. If the product of its digits equals half of the original number, what is the number?

The number is 36.

- 17 Find in $\mathbb{R}$ the S.S of equation using the general formula: $x^2 + 3x - 3 = 0$ in $\mathbb{R}$
 "to the nearest one decimal place"

S.S = {0.8 , -3.8}

- 18 Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the following two equations: $x + y = 5$, $x^2 + y^2 = 13$

S.S = {(3 , 2) , (2 , 3)}



- 19) Two real numbers their sum is 10 and the difference between their squares is 40.
Find the two numbers.

The two numbers are 7 and 3.

- 20) Find in R the S.S of each equation using the general formula: $x^2 - x = 4$ in R
"to the nearest one decimal place"

S.S = {2.6 , -1.6}

- 21) The sum of two real numbers is 9 and the difference between their squares equals 45. Find the two numbers.

The two numbers are 7 and 2.



Follow for More!

Q1: Choose the correct answer

1 The set of zeroes of the function $f: f(x) = -3x$ is

- ☒ a $\{0\}$ ☐ b $\{-3\}$ ☐ c $\{-3, 0\}$ ☐ d $\mathbb{R}$

2 The set of zeroes of the function $f: f(x) = \text{zero}$ is

- ☐ a $\emptyset$ ☐ b $\mathbb{R} - \{0\}$ ☐ c $\{0\}$ ☒ d $\mathbb{R}$

3 If $z(f) = \{2\}$, $f(x) = x^3 - m$, then $m = \dots$

- ☐ a $\sqrt[3]{2}$ ☐ b 2 ☐ c 4 ☒ d 8

4 The set of zeroes of the function $f: f(x) = \frac{2-x}{7}$ is

- ☐ a $\emptyset$ ☒ b $\{2\}$ ☐ c $\{2, 7\}$ ☐ d $\{7\}$

5 The set of zeroes of the function $f: f(x) = \frac{x^2-9}{x-2}$ is

- ☐ a $\{2\}$ ☐ b $\mathbb{R} - \{2\}$ ☒ c $\{3, -3\}$ ☐ d $\{3, -3, 2\}$

6 If $x = 3$ is one of the zeroes of the function $f: f(x) = \frac{x^2 - 2x + k}{x^2 - 25}$, then $k = \dots$

- ☐ a 3 ☐ b 6 ☒ c -3 ☐ d -6

7 The common domain of the two fraction $\frac{2}{x^2-1}$, $\frac{5x}{x^2-x}$ is

- ☐ a $\mathbb{R} - \{1\}$ ☐ b $\mathbb{R} - \{0, 1\}$ ☒ c $\mathbb{R} - \{0, 1, -1\}$ ☐ d $\mathbb{R} - \{1, -1\}$

8 The common domain of the two fraction $\frac{2x}{x-3}$, $\frac{x}{x+5}$ is

- ☐ a $\{3, -5\}$ ☐ b $\mathbb{R} - \{0, 3, -5\}$ ☒ c $\mathbb{R} - \{3, -5\}$ ☐ d $\mathbb{R}$

9 The set of zeroes of the function $f: f(x) = x^2 + 1$ is

- ☒ a $\emptyset$ ☐ b $\{-1\}$ ☐ c $\{-1, 1\}$ ☐ d $\{0\}$



10 The domain of the function $f: f(x) = \frac{x-7}{3(x-3)}$ is

- (a) $\mathbb{R} - \{-1\}$ (b) $\mathbb{R} - \{3\}$ (c) $\mathbb{R} - \{-1, 3\}$ (d) $\mathbb{R}$

11 The common domain of the two fraction $\frac{x}{x+1}, \frac{x+2}{x^2+4}$ is

- (a) $\{-1\}$ (b) $\{-1, -4\}$ (c) $\mathbb{R} - \{-1\}$ (d) $\{-1, 2, -2\}$

12 If $x \neq 0$, then $\frac{5x}{x^2+1} \div \frac{x}{x^2+1} = \dots\dots\dots$

- (a) 1 (b) -1 (c) -5 (d) 5

13 If $\{2\}$ is the set of zeroes of the function $f: f(x) = x^3 - m$, then $m = \dots\dots\dots$

- (a) 8 (b) 6 (c) 4 (d) 2

14 If $n(x) = \frac{x}{x^2+9}$, then the domain of n^{-1} is

- (a) $\emptyset$ (b) $\mathbb{R} - \{-3, 3, 0\}$ (c) $\mathbb{R}$ (d) $\mathbb{R} - \{0\}$

15 If $n(x) = \frac{x^2-2x}{(x-2)(x^2+2)}$, then the domain of n^{-1} is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{2\}$ (c) $\mathbb{R} - \{0, 2\}$ (d) $\mathbb{R} - \{0\}$

16 The domain of the multiplicative inverse of the algebraic fraction $\frac{x-2}{x^3+27}$ is

- (a) $\mathbb{R} - \{2\}$ (b) $\mathbb{R} - \{-3, 2\}$ (c) $\mathbb{R} - \{2, -3, 3\}$ (d) $\mathbb{R} - \{-3, 3\}$

17 If $x \in \mathbb{R} - \{0, 1\}$, then $\frac{1-x}{x} \div \frac{x-1}{x}$ in simplest form is

- (a) 1 (b) -1 (c) $x-1$ (d) x

18 If $n_1(x) = \frac{x^2-4}{x-3}$, $n_2(x) = x+3$, then $n_1 = n_2$ when they have the same domain which is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{3\}$ (c) $\mathbb{R} - \{-3\}$ (d) $\mathbb{R} - \{1\}$



19 The algebraic fraction $\frac{1}{x}$ equals the algebraic fraction where $x \neq 0$

☒ a $\frac{x}{x^2}$

☐ b $\frac{1}{x^2}$

☐ c $\frac{x}{2}$

☐ d $\frac{x+1}{x}$

20 The set of zeroes of the function f where $f(x) = x(x^2 - 2x + 1)$ is

☒ a $\{0, 1\}$

☐ b $\{0, -1\}$

☐ c $\{0\}$

☐ d $\{1\}$

21 The additive inverse of the algebraic fraction $\frac{2}{x-1}$ is, where $x \neq 0$

☐ a $\frac{-2}{x+1}$

☐ b $\frac{x-1}{2}$

☒ c $\frac{2}{1-x}$

☐ d $\frac{-2}{-x+1}$

22 The set of zeroes of the function $f: f(x) = x^2 + 25$ is

☒ a $\emptyset$

☐ b $\{5\}$

☐ c $\{5, -5\}$

☐ d $\mathbb{R}$

23 The set of zeroes of f where $f(x) = \frac{x^2 - 3x + 2}{x - 2}$ is

☐ a $\{2\}$

☒ b $\{1\}$

☐ c $\mathbb{R} - \{2\}$

☐ d $\{1, 2\}$

24 If: 3 is one of the zeros of the function $f(x) = x^2 - 3x + m$, then m is

☒ a 0

☐ b 6

☐ c 3

☐ d -6

25 The additive inverse of the fraction $\frac{x+1}{x-5}$ is

☒ a $\frac{x+1}{5-x}$

☐ b $\frac{1-x}{x-5}$

☐ c $\frac{1-x}{5-x}$

☐ d $\frac{1-x}{x+5}$

26 If $n(x) = \frac{1}{(x^2 - 4)^2}$, then the domain of n^{-1} is

☐ a $\mathbb{R} - \{1, 4\}$

☒ b $\mathbb{R} - \{2, -2\}$

☐ c $\mathbb{R} - \{1\}$

☐ d $\mathbb{R}$

27 If $n(x) = \frac{x-2}{x+1}$, then the domain of n^{-1} is

☐ a $\mathbb{R} - \{-1\}$

☐ b $\mathbb{R} - \{2\}$

☐ c $\mathbb{R} - \{1, -2\}$

☒ d $\mathbb{R} - \{-1, 2\}$



Q2: Answer The Following

- 1 If the set of zeroes of the function $f: f(x) = \frac{x^2 - ax + 16}{x + b}$, is $\{4\}$ and its domain is $\mathbb{R} - \{2\}$, find the value of each of a and b

$$a = 8 \quad b = -2$$

- 2 Find $n(x)$ in the simplest form, showing the domain of n where:

$$n(x) = \frac{3x}{x^2 - x - 2} + \frac{x - 1}{1 - x^2}$$

$$\mathbb{R} - \{2, 1, -1\}$$

$$n(x) = \frac{2}{x - 2}$$

- 3 If $n_1(x) = \frac{2x}{2x + 8}$, $n_2(x) = \frac{x^2 + 4x}{x^2 + 8x + 16}$, prove that: $n_1 = n_2$

$$\mathbb{R} - \{4\}$$

$$n(x) = \frac{x}{x + 4}$$

- 4 If the set of zeroes of the function $f: f(x) = \frac{x^2 - ax + 9}{bx + 4}$, is $\{3\}$ and its domain is $\mathbb{R} - \{2\}$

Find: the value of each of a and b

$$a = 6$$

$$b = -2$$



5 If $n(x) = \frac{x^2 + cx + 12}{x^2 + 3x + a}$, the domain of $n = \mathbb{R} - \{3, b\}$, $n(4) = 6$

Find the values of a , b and c

$$a = -18$$

$$b = -6$$

$$c = 8$$

6 Find $n(x)$ in the simplest form, showing the domain of n :

$$n(x) = \frac{x^3 - 8}{x^2 + x - 6} \div \frac{x^2 + 2x + 4}{x + 3}$$

$$\mathbb{R} - \{2, -4\}$$

$$n(x) = 1$$

7 Find in the simplest form, showing the domain: $n(x) = \frac{x^3 - 8}{x^2 - 9} \times \frac{x + 3}{x^2 + 2x + 4}$

$$\mathbb{R} - \{3, -3\}$$

$$n(x) = \frac{x - 2}{x - 3}$$

8 Find $n(x)$ in the simplest form, showing the domain of n where:

$$n(x) = \frac{3x - 6}{x^2 - 4} - \frac{9}{2 - x - x^2}, \text{ Find: } n(1) \text{ if possible.}$$

$$\mathbb{R} - \{2, -2, 1\}$$

$$n(x) = \frac{3}{x - 1}$$



$$(x+y)^2 = (x-y)^2$$



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$$a^m / a^n = a^{m-n}$$

$$c^2 = a^2 + b^2$$

$$c^2 = a^2 + b^2$$

9 Find in the simplest form, showing the domain: $n(x) = \frac{x^2 + 2x + 4}{x^3 - 8} + \frac{x^2 - 2x - 3}{x^2 - 5x + 6}$

$$R - \{3, 2\}$$

$$n(x) = \frac{x+2}{x-2}$$

10 Find $n(x)$ in the simplest form, showing the domain where:

$$n(x) = \frac{x^2 - 4}{x^2 - 5x + 6} - \frac{5}{x - 3}$$

$$R - \{3, 2\}$$

$$n(x) = 1$$

11 Find $n(x)$ in its simplest form, showing the domain of n where :

$$n(x) = \frac{x^2 + 2x}{x^3 - 27} \div \frac{x + 2}{x^2 + 3x + 9}$$

$$R - \{3, -2\}$$

$$n(x) = \frac{x}{x-3}$$

12 If $f: f(x) = \frac{x^2 + k}{x^2 - mx + 6}$, its domain is $R - \{2, 3\}$, $f(4) = 9$,

Find: m, k

$$m = 5$$

$$k = 2$$



13) If the domain of $n(x) = \frac{b}{x} + \frac{9}{x+a}$, $R - \{0, 4\}$, $n(5) = 2$.

Find the value of a and b

$$a = -4$$

$$b = -35$$

14) If $n(x) = \frac{x^2 - 5x}{x^2 - 6x + 5}$, find $n_1(x)$ in the simplest form, showing the domain of n^{-1}

$$R - \{0, 1, 5\}$$

$$n(x) = \frac{x}{x-1}$$

15) Find $n(x)$ in the simplest form, showing the domain of n :

$$n(x) = \frac{2x+6}{x^2+x-6} - \frac{x^2-6x}{x^2-8x+12}$$

$$R - \{-3, 2, 6\}$$

$$n(x) = -1$$

16) Find in the simplest form, showing the domain: $n(x) = \frac{x^2 - x - 6}{x^2 - 4} \times \frac{x^2 - 2x}{x - 3}$

$$R - \{-2, 2, 3\}$$

$$n(x) = x$$



17 If $n_1(x) = \frac{x^2 - 4}{x^2 + x - 6}$, $n_2(x) = \frac{x^2 - x - 6}{x^2 - 9}$ are $n_1 = n_2$ or not why?

No, because their domains are different

18 If the domain of the function n where $n(x) = \frac{x - 1}{x^2 - ax + 9}$ is $\mathbb{R} - \{3\}$ find the value of a

$a = 6$

19 If $n(x) = \frac{x + 2}{x^2 - x - 6}$, find $n^{-1}(x)$ in the simplest form showing its domain.

Find: $n^{-1}(x) = 2$, what is the value of x

$\mathbb{R} - \{3, -2\}$

$n^{-1}(x) = x - 3$

$x = 5$

20 Find $n(x)$ in the simplest form, showing the domain of n where:

$$n(x) = \frac{x - 3}{x^2 - 7x + 12} - \frac{x - 3}{3 - x}$$

$\mathbb{R} - \{3, 4\}$

$$n(x) = \frac{x - 3}{x - 4}$$



21 Find in the simplest form, showing the domain: $n(x) = \frac{x^2 - 12x + 36}{x^2 - 6x} \times \frac{4x + 24}{x^2 - 36}$

$$R - \{0, 6, -6\}$$

$$n(x) = \frac{4}{x}$$

22 Find in the simplest form, showing the domain: $n(x) = \frac{x^2 - 3x + 2}{x^2 - 1} \div \frac{3x - 15}{x^2 - 6x + 5}$

$$R - \{1, -1, 5\}$$

$$n(x) = \frac{(x-3)(x-1)}{3(x+1)}$$

23 If $n(x) = \frac{x^2 + 4x + 3}{x^3 + 27}$, find $n^{-1}(x)$ in the simplest form showing its domain.

$$R - \{-3, -1\}$$

$$n^{-1}(x) = \frac{x^2 - 3x + 9}{x + 1}$$



Follow for More!

Q1: Choose the correct answer

1 If A, B are two mutually exclusive events from the sample space of a random experiment, then $P(A \cap B) = \dots\dots\dots$.

☒ a zero☐ b 1☐ c $\frac{1}{2}$ ☐ d -1

2 If $P(A) = 4 P(A^c)$, then $P(A) = \dots\dots\dots$.

☐ a 0.6☐ b 0.4☐ c 0.2☒ d 0.8

3 If $A \subset B$, then $P(A \cup B) = \dots\dots\dots$.

☐ a $P(A)$ ☒ b $P(B)$ ☐ c 1☐ d $P(A \cap B)$

4 If A and B are two mutually exclusive events of a sample space of a random experiment, then $P(A - B) = \dots\dots\dots$.

☒ a $P(A)$ ☐ b $P(B)$ ☐ c $P(A^c)$ ☐ d $P(B^c)$

5 The probability of the certain event equals $\dots\dots\dots$.

☐ a zero☒ b 1☐ c $\frac{1}{2}$ ☐ d $\emptyset$

6 If A and B are two events from the sample space of a random experiment , $P(A) = 0.6$ and $P(A \cap B) = 0.4$, then $P(A - B) = \dots\dots\dots$.

☐ a 0.6☐ b 0.4☒ c 0.2☐ d 0.1

7 If A is an event of the sample space (S) of a random experiment and $P(A^c) = P(A)$, then $P(A) = \dots\dots\dots$.

☒ a $\frac{1}{2}$ ☐ b $\frac{1}{3}$ ☐ c $\frac{2}{3}$ ☐ d 1

8 In an experiment of throwing a fair die once, the probability of appearing a prime number is

☒ a $\frac{1}{2}$

☐ b $\frac{1}{3}$

☐ c $\frac{2}{3}$

☐ d $\frac{3}{4}$

9 The probability of the impossible event is

☒ a zero

☐ b 1

☐ c $\frac{1}{2}$

☐ d $\emptyset$

10 If a fair die is rolled once , then the probability of appearing a number less than or equal 3 equals

☒ a $\frac{1}{2}$

☐ b $\frac{1}{3}$

☐ c $\frac{2}{3}$

☐ d $\frac{1}{6}$

11 If A and B are two events of a sample space S, $A \subset B$, then $P(A \cup B) = \dots\dots\dots$

☐ a $P(A)$

☒ b $P(B)$

☐ c $P(A \cap B)$

☐ d 0

12 If $\bar{A}$ is the complementary event of A in the sample space of a random experiment, Then $P(\bar{A} \cup A) = \dots\dots\dots$

☒ a S

☐ b 1

☐ c $\frac{1}{2}$

☐ d $\emptyset$

13 If the probability of the failure of a student is 0.2, then the probability of his success is

☐ a 8

☐ b 1

☐ c $\frac{1}{5}$

☒ d $\frac{4}{5}$

14 If $A \subset B$, then $P(A - B) = \dots\dots\dots$

☐ a $P(A)$

☐ b $P(B)$

☒ c zero

☐ d 1

15 If $A \subset S$ of a random experiment and $P(\bar{A}) = 2 P(A)$, then $P(A) = \dots\dots\dots$

☐ a $\frac{1}{2}$

☒ b $\frac{1}{3}$

☐ c $\frac{2}{3}$

☐ d 1



16) If A is an event from the sample space of a random experiment, then $P(A^c) = \dots\dots\dots$

- ☐ a $P(A) - 1$
☒ b $1 - P(A)$
☐ c -1
☐ d 1

17) If $A \subset B$, then $P(A \cap B) = \dots\dots\dots$

- ☒ a $P(A)$
☐ b $P(B)$
☐ c zero
 ☐ d $\emptyset$

18) If A is an event from the sample space of a random experiment, and $P(A) = P(A^c)$, then $P(A) = \dots\dots\dots$

- ☐ a 1
☐ b 0.25
☒ c 0.5
☐ d 2

19) If A is an event from the sample space of a random experiment, and $P(A) = 3P(A^c)$, then $P(A) = \dots\dots\dots$

- ☐ a $\frac{1}{4}$
☒ b $\frac{3}{4}$
☐ c $\frac{1}{2}$
☐ d 1



Q2: Answer The Following

- 1 If A , B are two events of the sample space of a random experiment and $P(A) = 0.3$, $P(B) = P(B^c)$, $P(A \cap B) = 0.2$

Find: a $P(A \cup B)$

0.6

b $P(A - B)$

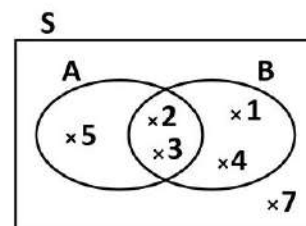
0.1

- 2 If the opposite figure represents the two events A and B in the sample space (S) of a random experiment, Find:

a $P(A \cap B) = \frac{1}{3}$

b $P(A \cup B) = \frac{5}{6}$

c $P(A - B) = \frac{1}{6}$



- 3 If A , B are two events in the sample space of a random experiment: $P(A) = 0.4$, $P(B) = 0.7$, $P(A \cup B) = 0.8$

Find: a $P(A \cap B)$

0.3

b $P(A - B)$

0.1

- 4 If A , B are two events of the sample space of a random experiment , $P(A) = 0.8$, $P(B) = 0.7$, $P(A \cap B) = 0.6$

Find: a $P(A \cup B)$

0.9

b The probability of non occurrence of A

0.2



5 If A, B are two events of the sample space of a random experiment and $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, Find $P(A \cup B)$ in each of the following two cases:

a) If $P(A \cap B) = \frac{1}{8}$ $\frac{17}{24}$

b) If A and B are two mutually exclusive events. $\frac{5}{6}$

6 A bag contains 20 identical cards numbered from 1 to 20. A card is randomly drawn. Find the probability that the number on the drawn card is :

a) divisible by 3 $\frac{3}{10}$

b) divisible by 3 or 5 $\frac{9}{20}$

7 If A and B are two events of the sample space of a random experiment , $P(A) = 0.3$, $P(B) = 0.6$, Find $P(A \cup B)$ in each of the following cases:

a) A and B are mutually exclusive events 0.9

b) $P(A \cap B) = 0.2$ 0.7

8 If A and B are two events of the sample space of a random experiment , $P(B) = \frac{1}{3}$, $P(A - B) = \frac{1}{4}$, Find $P(A)$ if:

a) $P(A \cap B) = \frac{1}{12}$ $\frac{1}{3}$

b) $B \subset A$ $\frac{7}{12}$



- 9 If A and B are two events from the sample space of a random experiment ,
 $P(A) = 0.5$, $P(A \cup B) = 0.8$ and $P(B) = 2x$, then calculate the value of x if :

a $A \subset C$

0.4

b $P(A \cap B) = 0.1$

0.2

- 10 A bag contains 20 identical cards numbered from 1 to 20. One card is drawn randomly. Find the probability that the number on the drawn card:

a Is divisible by 5

$\frac{1}{5}$

b Is odd and divisible by 5

$\frac{1}{10}$

- 11 If A and B are mutually exclusive events in the sample space of a random experiment and: $P(A) = 0.3$, $P(B) = 0.4$, find: $P(A \cup B)$, $P(A - B)$.

0.7

0.3



Second Geometry

Q1: Choose the correct answer

- 1 A chord of length 6 cm, is drawn in a circle of diameter length 10 cm, then the distance between the chord and the centre of the circle is
 (a) 3 cm (b) 4 cm (c) 5 cm (d) 2 cm
- 2 The centre of a circle is the origin, its radius length is 7 cm, which of the following points is not on the circle ?
 (a) (0 , 7) (b) (0 , -7) (c) (7 , 0) (d) (2 , 2)
- 3 If the diameter length of the circle M is 7 cm, MA = 4 cm, then A lies
 (a) inside the circle (b) on the circle (c) outside the circle (d) otherwise
- 4 It is impossible to draw a circle passing through the vertices of
 (a) a triangle (b) a rhombus (c) a square (d) a rectangle
- 5 The surface of the circle M $\cap$ the surface of the circle N = {A} and the radius length of one of them is 3 cm. and MN = 8 cm, then the radius length of the other circle equals cm
 (a) 5 (b) 6 (c) 11 (d) 16
- 6 If M , N are two touching circles internally, their radii lengths are 5 cm, 9 cm. , then MN = cm.
 (a) 14 (b) 4 (c) 5 (d) 9
- 7 The chord whose length is 8 cm. in a circle of radius length 5 cm. is at cm. distant from its centre.
 (a) 3 (b) 4 (c) 5 (d) 10



8 The number of symmetry axes of a circle is

- (a) zero (b) 1 (c) 2 (d) infinite number

9 If M is a circle of diameter length 6 cm, A is a point on the circle, then MA =

- (a) 3 cm (b) 4 cm (c) 5 cm (d) 6 cm

10 AB is a diameter of the circle whose centre is the origin point , if A = (2 , 0) , then B =

- (a) (2 , 2) (b) (0 , -2) (c) (-2 , 0) (d) (-2 , 2)

11 A circle of circumference 20π cm. then its area is π cm².

- (a) 10 (b) 100 (c) 200 (d) 400

12 The radius length of the circle whose centre is the origin point and passes through the point (3 ,4) equals length unit.

- (a) 3 (b) 4 (c) 5 (d) 7

13 The measure of the interior angle of the regular hexagon equals

- (a) 60° (b) 120° (c) 108° (d) 144°

14 The length of arc opposite to central angle of measure 120°, in a circle of radius r is

- (a) $\frac{1}{3}\pi r$ (b) πr (c) $\frac{2}{3}\pi r$ (d) $3\pi r$

15 The number of circles passing through three collinear points is

- (a) 0 (b) 1 (c) 3 (d) infinite number

16 M and N are two circles, their radii lengths are 9 cm. and 6 cm. , the two circles are distant if MN 15 cm

- (a) > (b) < (c) = (d) ≥



17 M and N are two circles touching externally, the radius length of the circle M = 4 cm, if MN = 7 cm, then the circumference of the circle N equals

- (a) 4π (b) 6π (c) 7π (d) π

18 Two circles, the lengths of their radii are 5 cm, 8 cm. are touching, then the distance between their centres

- (a) $]3, 13[$ (b) $]13, \infty[$ (c) $]0, 3[$ (d) $\{3, 13\}$

19 The line of centres of two intersecting circles is perpendicular to and bisects it

- (a) the diameter (b) the chord (c) the tangent (d) the common chord

20 A circle of circumference 6π cm. and the straight line L is distant from its centre by 3 cm. then the straight line L is

- (a) a diameter (b) a secant (c) a tangent (d) outside the circle

21 If the straight line L is a tangent to the circle M of diameter length 8 cm. , then the distance between L and the centre of the circle equals cm

- (a) 3 (b) 4 (c) 6 (d) 8

22 Lengths of two adjacent sides of a parallelogram are 7 cm, 5 cm, the longer height is 6 cm, then its area =

- (a) 35 (b) 42 (c) 30 (d) 18

23 The circumference of a circle M is 12π cm, the point A is in the plane of the circle. If MA = 5 cm, then the point A lies the circle.

- (a) outside (b) inside (c) on (d) at the centre of

24 The number of altitudes of the isosceles triangle is

- (a) zero (b) 1 (c) 3 (d) infinite



25 The point of concurrence of the medians of the triangle divides each median by the ratio from the base.

- (a) 1 : 3 (b) 2 : 1 (c) 3 : 1 (d) 1 : 2

26 The number of circles which pass through three non-collinear points is

- (a) zero (b) 1 (c) 2 (d) 3

27 In ΔABC , if $(AB)^2 + (BC)^2 = (AC)^2$, then $\angle B$ is

- (a) obtuse (b) right (c) acute (d) straight

28 M, N are two touching externally circles, the lengths of their radii are 7 cm, 3 cm, then MN = cm.

- (a) 4 (b) 12 (c) 6 (d) 10

29 The greatest chord in a circle is 16 cm, then its circumference = cm

- (a) 8π (b) 4π (c) 12π (d) 16π

30 A circle has an area of $9\pi \text{ cm}^2$, and a line L is 3 cm away from its center, then the line L will be

- (a) tangent to the circle (b) secant to the circle
(c) outside the circle (d) diameter

31 The circumcircle of a triangle has its center at the intersection of

- (a) The bisectors of its internal angles (b) Its altitudes
(c) The axes of symmetry of its sides (d) The bisectors of its external angles

32 A chord of length 6 cm is drawn inside a circle with a diameter of 10 cm, then it is at cm from the center:

- (a) 2 (b) 3 (c) 4 (d) 6



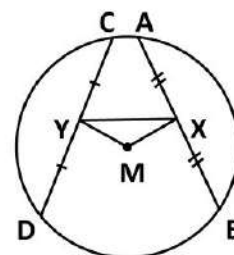
Q2: Answer The Following

1 In the opposite figure :

In the circle of centre M, $AB = CD$,

$m(\angle XMY) = 130^\circ$, X and Y are the midpoints of AB and CD

Find with proof: $m(\angle MXY)$

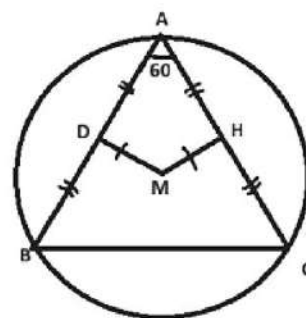


2 In the following figure:

D, H mid-points of AB, AC, $MD = MH$,

$BC = 8$ cm, $m(\angle A) = 60^\circ$

Find the perimeter of $\triangle ABC$

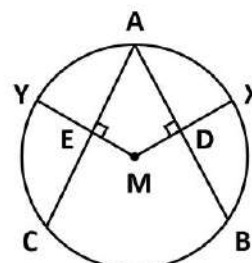


3 In the opposite figure :

$AB = AC$, $\overline{MD} \perp \overline{AB}$

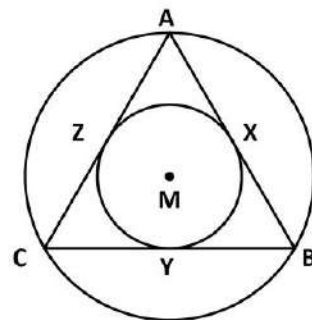
$\overline{ME} \perp \overline{AC}$

Prove that: $XD = YE$



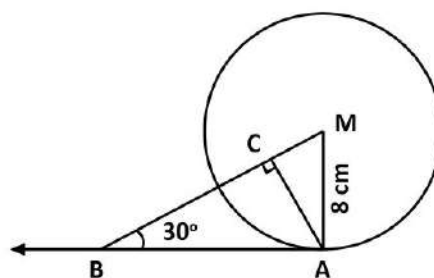
4 In the opposite figure:

Two concentric circles, ΔABC is drawn in which all vertices lie on greater circle and its sides touch the smaller circle X, Y, Z
Prove that: ΔABC is an equilateral triangle.



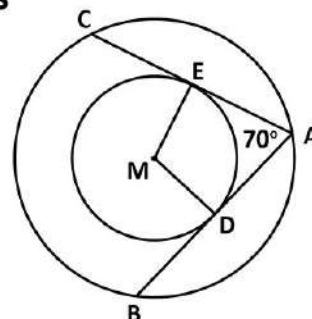
5 In the opposite figure:

AB is a tangent to the circle M at A,
MA = 8 cm.
, $m(\angle ABM) = 30^\circ$ and $\overline{AC} \perp \overline{MB}$
Find : The length of each of $\overline{AB}$ and $\overline{AC}$

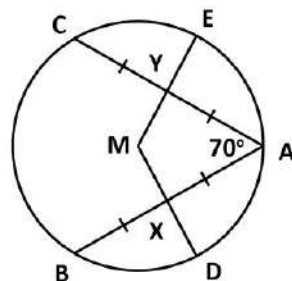


6 In the opposite figure:

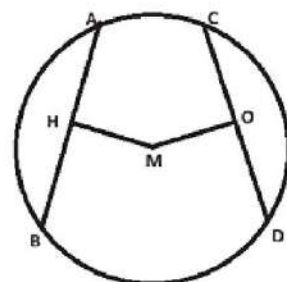
Two concentric circles at M, AB, AC are two tangent-segments to the smaller circle at D, E respectively, $m(\angle BAC) = 70^\circ$
Prove that: a) $AB = AC$
b) Find: $m(\angle DME)$



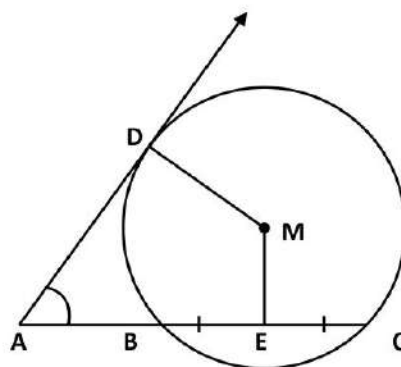
- 7 In the opposite figure:
 $\overline{AB}$, $\overline{AC}$ chords equal in length in the circle M, X is the midpoint of $\overline{AB}$, Y is the midpoint of $\overline{AC}$ and $m(\angle BAC) = 70^\circ$
 Find: $m(\angle DME)$
 Prove that: $XD = YE$



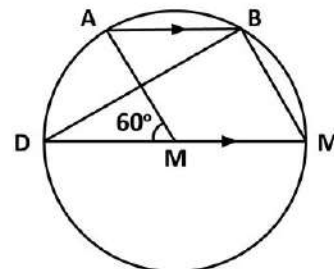
- 8 In the following AB, AC two chords in the circle M,
 $MH = MO$, $AH = 8\text{cm}$. Find CD



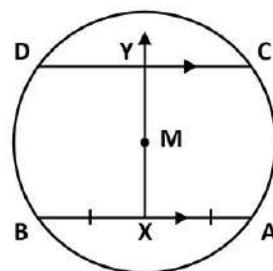
- 9 In the opposite figure :
 $\overrightarrow{AD}$ is a tangent to the circle M
 $\overline{AC}$ intersects the circle M at B and C
 $m(\angle A) = 56^\circ$, E is the midpoint of $\overline{BC}$
 Find: $m(\angle DME)$



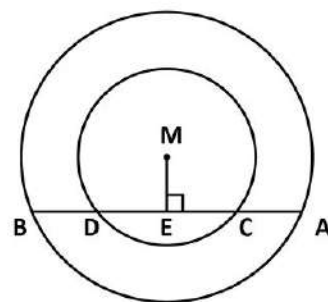
- 10 In the opposite figure :
 $\overline{DC}$ is a diameter in the circle M,
 $\overline{DC} \parallel \overline{AB}$,
 $m(\angle AMD) = 60^\circ$
 Find with proof : $m(\angle ABD)$ and $m(\angle BCD)$



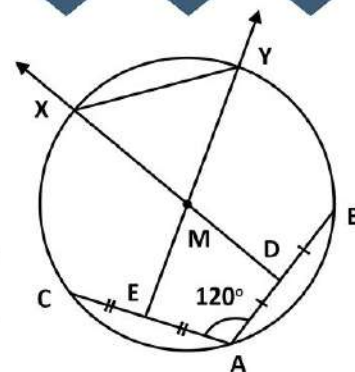
- 11 In the opposite figure:
 M is a circle , $\overline{AB} \parallel \overline{CD}$,
 X is the midpoint of AB
 and XM is drawn to cut CD at Y
 Prove that : Y is the midpoint of CD



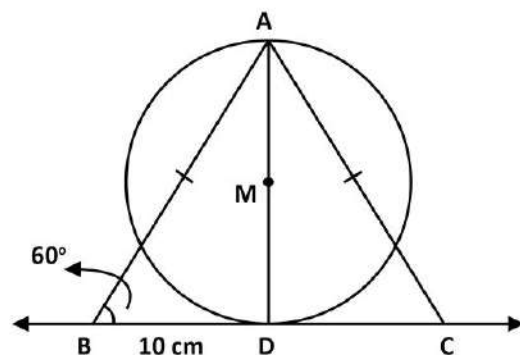
- 12 In the opposite figure :
 Two concentric circles with centre M,
 AB is a chord of the greater circle
 and intersects the smaller circle at C, D
 and $ME \perp AB$, Prove that : $AC = BD$



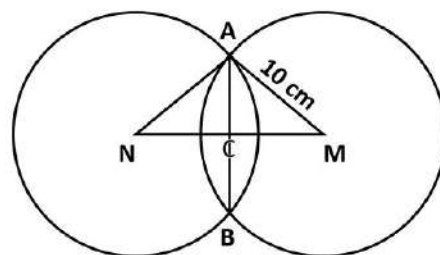
- 13 Using the givens of the figure :
Prove that : The triangle XYM is an equilateral triangle.



- 14 In the opposite figure:
CB is a tangent to the circle M ,
 $AB = AC$, $BD = 10$ cm
 $m(\angle CBA) = 60^\circ$
Find with proof: The perimeter of ΔABC



- 15 In the opposite figure :
Two congruent circles M and N are intersecting
at A and B, If $MA = 10$ cm, $AB = 12$ cm.
Find by proof: The length of MN



- 16 Draw the right angled triangle ABC at B where $AB = 4$ cm. and $BC = 3$ cm.
then draw the circumcircle of this triangle.
Where does the centre of the circle lie with respect to the sides of this triangle ?



Q1: Choose the correct answer

- 1 The measure of an interior angle of regular hexagon is
 - a 60°
 - b 108°
 - c 120°
 - d 135°
- 2 If MA, MB are two perpendicular radii in a circle M, Area of $\Delta AMB = 18 \text{ cm}^2$, then radius of circle M = cm
 - a 4
 - b 6
 - c 9
 - d 3
- 3 ABCD is a quadrilateral inscribed in a circle, $m(\angle A) = 70^\circ$. then $m(\widehat{BAD}) = \dots\dots\dots^\circ$.
 - a 35
 - b 55
 - c 140
 - d 220
- 4 ABC is an equilateral triangle inscribed in a circle, then $m(\widehat{AB}) = \dots\dots\dots$.
 - a 30°
 - b 60°
 - c 120°
 - d 240°
- 5 The inscribed angle which is drawn in a semicircle is
 - a acute
 - b obtuse
 - c straight
 - d right
- 6 The measure of the central angle the measure of the inscribed angle subtended by the same arc.
 - a half
 - b twice
 - c triple
 - d equal
- 7 An arc in a circle, its length $= \frac{1}{3} \pi r$, then it is opposite to a central angle of measure
 - a 30°
 - b 60°
 - c 120°
 - d 240°
- 8 The circumference of a circle is 36 cm, then the measure of an arc of it with length 6 cm is
 - a 30°
 - b 60°
 - c 120°
 - d 90°



9 The length of the arc opposite to a central angle of measure 30° in a circle of circumference 36 cm. equals cm

- (a) 18 (b) 9 (c) 3 (d) 4.5

10 The length of the arc that is opposite to a right inscribed angle in a circle whose circumference is 44 cm. equals cm.

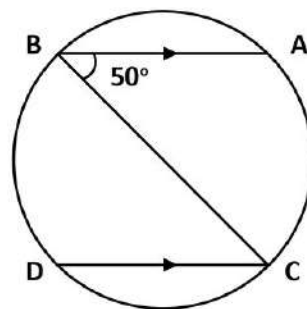
- (a) 22 (b) 11 (c) $\frac{22}{7}$ (d) $\frac{44}{7}$

11 In the opposite figure:

$BA \parallel CD$, $m(\angle B) = 50^\circ$

, then $m(\widehat{AC}) + m(\widehat{BD}) = \dots\dots\dots$

- (a) 50° (b) 200°
(c) 150° (d) 180°



12 The number of common tangents of two circles which are one circle inside the other without touching is

- (a) 3 (b) 2 (c) 1 (d) 0

13 The number of common tangents of two circles touching internally equals

- (a) 3 (b) 2 (c) 1 (d) 0

14 The number of common tangents of two touching externally circles is

- (a) 3 (b) 2 (c) 1 (d) 0

15 The number of tangents can be drawn from a point lying on a circle is

- (a) zero (b) 1 (c) 4 (d) infinite

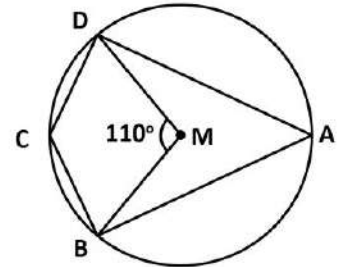
16 The number of common tangents of two distant circles is

- (a) 3 (b) 1 (c) 4 (d) 2



- 17 In the opposite figure:
If M is the centre of the circle
 $m(\angle BMD) = 110^\circ$
, then $m(\angle C) = \dots\dots\dots$

a 70° b 90°
c 125° d 135°



- 18 The sum of measures of two complementary angles is

a 45° b 90° c 180° d 360°

- 19 If ABCD is a square drawn in a circle, then $m(\widehat{AB}) = \dots\dots\dots$

a 60° b 90° c 120° d 180°

- 20 The measure of the inscribed angle drawn in a semicircle equals $^\circ$

a 360 b 180 c 90 d 120

- 21 Area of triangle whose base length 10 cm and height length 6 cm is cm^2

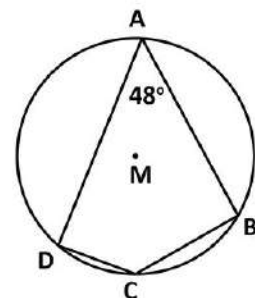
a 16 b 30 c 32 d 60

- 22 M, N, L are three touching externally circles two by two, their radii 5, 6 and 4 cm
then perimeter of $\Delta MNL = \dots\dots\dots$ cm.

a 15 b 30 c 40 d 60

- 23 In the opposite figure:
If $m(\angle A) = 48^\circ$
, then $m(\widehat{BD})$ the major =

a 260° b 265°
c 264° d 262°

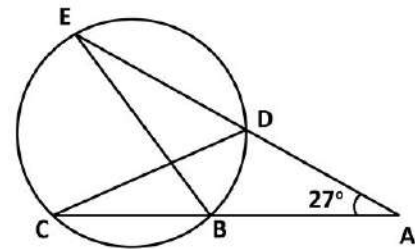


- 24 The inscribed angle subtended by a minor arc in the circle is

a acute b obtuse c straight d right



- 25 In the opposite figure:
AD intersects the circle at D and E,
AB intersects, it at B and C
If $m(\angle A) = 27^\circ$, $AB = BE$, then $m(\angle CDE) = \dots\dots\dots$



- (a) 13.5° (b) 54° (c) 27° (d) 36°

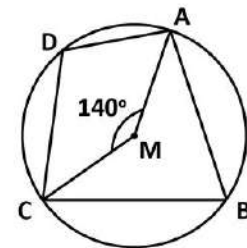
- 26 ABCD is a cyclic quadrilateral in which: $m(\angle A) = m(\angle C)$, then $m(\angle A) = \dots\dots\dots$

- (a) 60° (b) 90° (c) 120° (d) 180°

- 27 ABCD is a cyclic quadrilateral. If $m(\angle ACB) = 80^\circ$, then $m(\angle ADB) = \dots\dots\dots$

- (a) 40° (b) 80° (c) 100° (d) 160°

- 28 In the opposite figure :
In the circle M, if $m(\angle AMC) = 140^\circ$
, then $m(\angle ADC) = \dots\dots\dots$



- (a) 40° (b) 70°
(c) 110° (d) 140°

- 29 In the cyclic quadrilateral ABCD, if $m(\angle A) = 3m(\angle C)$, then $m(\angle A) = \dots\dots\dots$

- (a) 45° (b) 90° (c) 120° (d) 135°

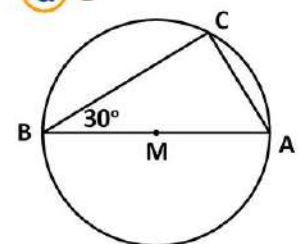
- 30 The two tangent-segments drawn from a point outside a circle are

- (a) parallel (b) perpendicular (c) equal in length (d) not equal in length

- 31 The number of the common tangents of the two touching externally circles is

- (a) zero (b) 1 (c) 2 (d) 3

- 32 In the opposite figure:
AB is a diameter of the circle M
, $m(\angle B) = 30^\circ$, $AC = 6$ cm.
, then $AB = \dots\dots\dots$ cm .



- (a) 3 (b) 6 (c) 9 (d) 12



33 The ratio between the measure of the inscribed angle and the measure of the central angle subtended by the same arc is

(a) 2 : 1

(b) 1 : 2

(c) 2 : 2

(d) 2 : 3

34 If the measure of a tangency angle is 50° , then the measure of the inscribed angle that shares the same arc is

(a) 50°

(b) 100°

(c) 130°

(d) 150°

35 ABCD cyclic quadrilateral has $m(\angle A) = 2m(\angle C)$, then $m(\angle C) = \dots\dots\dots$

(a) 30°

(b) 60°

(c) 120°

(d) 90°

36 If ABCD cyclic quadrilateral, then $m(\angle A) + m(\angle C) - 40^\circ = \dots\dots\dots$

(a) 60°

(b) 140°

(c) 80°

(d) 180°

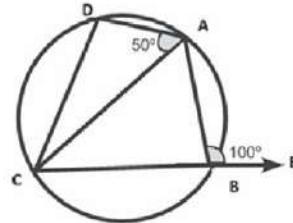
37 In the opposite figure:
 $E \in BC$, $m(\angle ABE) = 100^\circ$,
 $m(\angle CAD) = 50^\circ$,
 then $m(\angle ACD) = \dots\dots\dots$

(a) 50°

(b) 100°

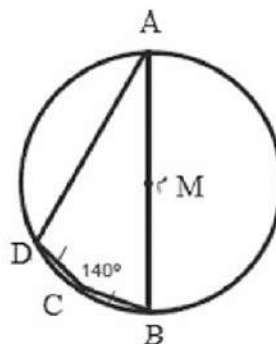
(c) 80°

(d) 30°

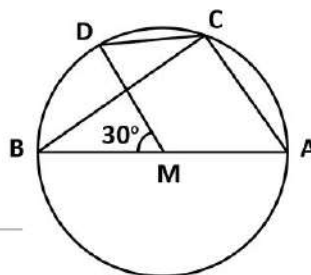


Q2: Answer The Following

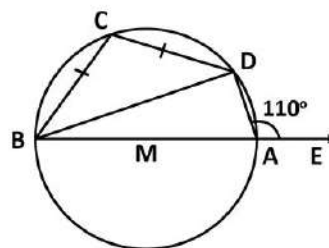
- 1 In the opposite figure:
 ABCD cyclic quadrilateral drawn inside the circle M,
 $M \in AB$, $CB = CD$
 Find: $m(\angle A)$ and $m(\angle D)$



- 2 In the opposite figure:
 AB is diameter in circle M, $m(\angle BMD) = 30^\circ$,
 Find: $m(\angle BCD)$ and $m(\angle ACD)$



- 3 In the opposite figure:
 AB is a diameter of the circle M
 $E \in BA$, $CD = CB$. $m(\angle DAE) = 110^\circ$.
 Find: $m(\angle ADC)$



- 4 Find the length of the arc which represents $\frac{3}{4}$ the length of the circle whose diameter length is 14 cm (where $\pi = \frac{22}{7}$)



$$(x+y)^2 = (x-y)^2$$

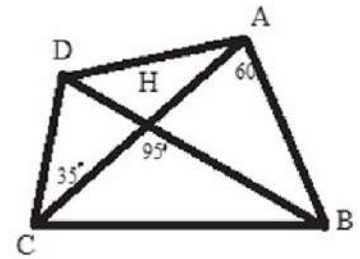
AHMED NASSR

$$a^3/a^m = a^{m-n}$$

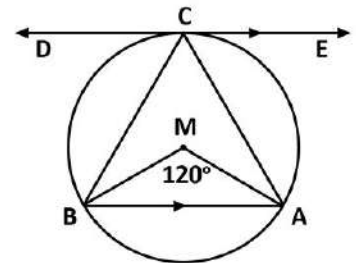
$$c^2 = a^2 + b^2$$

$$c^2 = a^2 + b^2$$

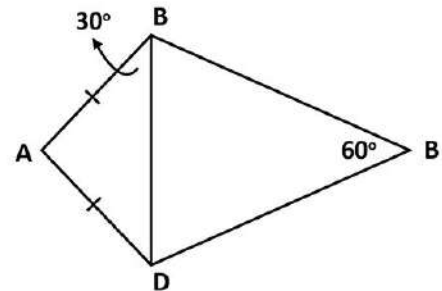
- 5 In the opposite figure: $m(\angle BAC) = 60^\circ$,
 $m(\angle BHC) = 95^\circ$, $m(\angle DCA) = 35^\circ$.
 Prove that: quadrilateral ABCD is cyclic



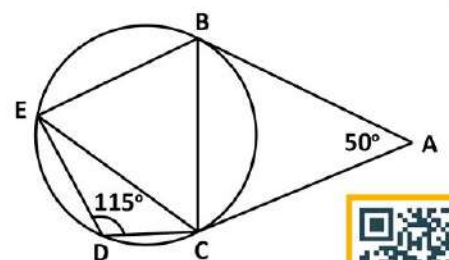
- 6 In the opposite figure:
 a tangent to the circle M at C ,
 $CD \parallel AB$, $m(\angle AMB) = 120^\circ$
 First : Find with proof $m(\angle ACB)$
 Second : Prove that ΔABC is an equilateral triangle.



- 7 In the opposite figure:
 ABCD is a quadrilateral in which $AB = AD$:
 $m(\angle ABD) = 30^\circ$, $m(\angle C) = 60^\circ$
 Prove that: ABCD is a cyclic quadrilateral.



- 8 In the opposite figure:
 AB, AC are two tangent-segments to the circle at B , C
 $m(\angle A) = 50^\circ$, $m(\angle D) = 115^\circ$
 Prove that: 1] BC bisects $\angle ABE$
 2] $CB = CE$

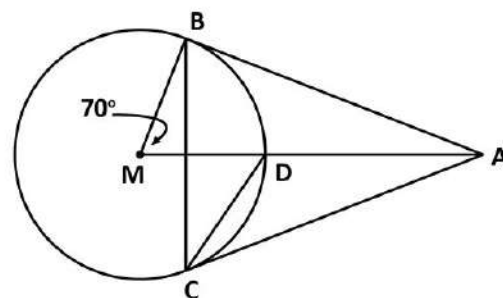


9 In the opposite figure:

AB, AC are two tangent-segments drawn from point A, $m(\angle AMB) = 70^\circ$

Find: 1] $m(\angle ABC)$

2] $m(\angle ACD)$



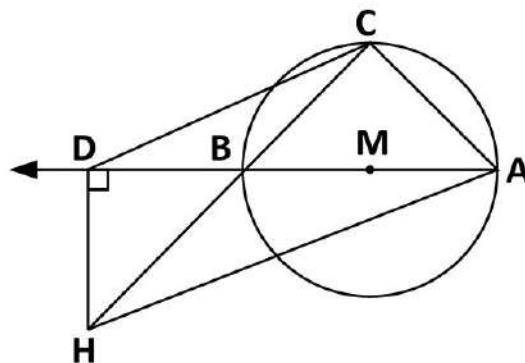
10 In the opposite figure:

AB is a diameter in circle M, $D \in AB$

, $D \notin AB$, $DH \perp AB$

, $C \in \widehat{AB}$, $CB \cap DH = \{H\}$

Prove that: ACDH is a cyclic quadrilateral



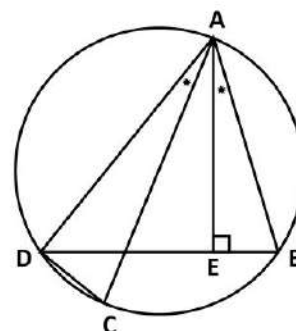
11 In the opposite figure :

$m(\angle BAE) = m(\angle DAC)$,

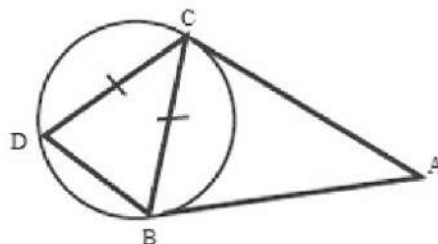
$AE \perp BD$

Prove that:

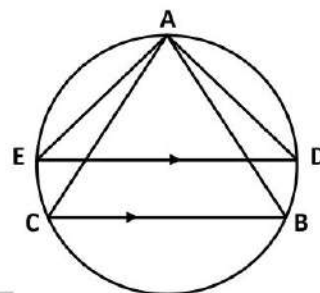
AC is a diameter in the circle.



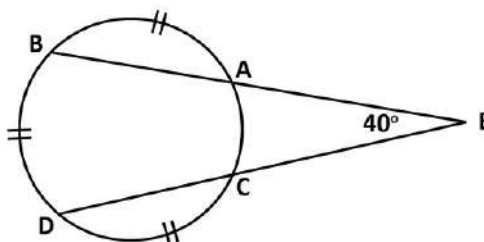
- 12 In the opposite figure:
 AB, AC are two tangents to circle M at B,C
 BC = CD
 Prove that: CD is tangent to the circle
 that passing through the vertices of triangle ABC



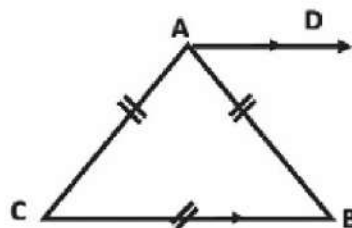
- 13 In the opposite figure:
 ΔABC is inscribed in
 a circle and $DE \parallel BC$
 Prove that: $m(\angle DAC) = m(\angle BAE)$



- 14 In the opposite figure:
 $m(\widehat{AB}) = m(\widehat{DB}) = m(\widehat{DC})$
 $m(\angle C) = 40^\circ$
 Find $m(\widehat{AC})$



- 15 In the opposite figure:
 ΔABC equilateral triangle
 $AD \parallel CB$
 prove that: AD is tangent to the circle that passes
 through the vertices of ΔABC





$$(x+y)^2 - (x-y)^2$$

$$\frac{a^m}{a^n} = a^{m-n}$$

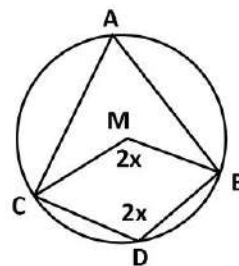
$$c^2 = a^2 + b^2$$

$$c^2 = a^2 + b^2$$

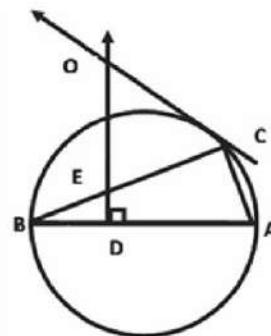
A circle with center O. Points A, B, and C are on the circumference. Triangle ABC is inscribed. The central angle AOB is labeled 120° . The angle ABC is labeled 70° . A ray AD is drawn tangent to the circle at point A, extending to the right.



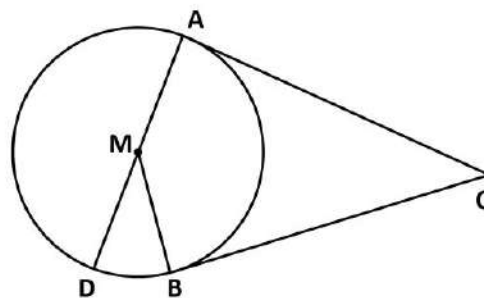
- 20 In the opposite figure:
ABDC is a cyclic quadrilateral ,
 $m(\angle BMC) = m(\angle BDC) = 2x^\circ$,
Find with proof $m(\angle A)$ in degrees .



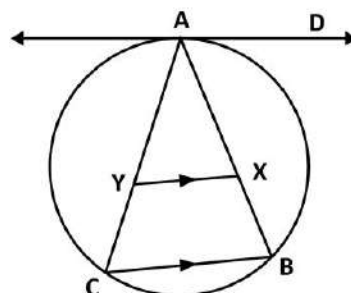
- 21 In the opposite figure:
AB diameter in a circle, CO tangent $DO \perp AB$
Prove that: a) ADEC cyclic quadrilateral
b) $\triangle OCE$ isosceles triangle



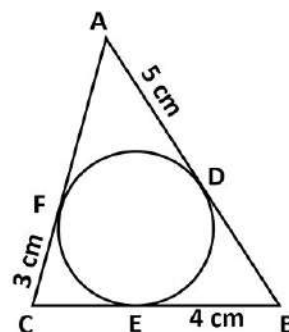
- 22 In the opposite figure:
AD is a diameter in the circle M
, CA, CB are two tangents to
the circle M at A , B
Prove that: $m(\angle DMB) = m(\angle ACB)$



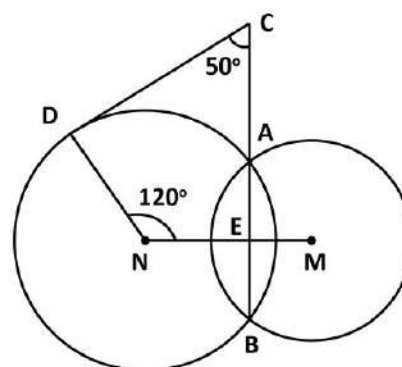
- 23** ABC is inscribed in a circle
AD is a tangent to the circle at A
 $X \in AB$, $Y \in AC$ where $XY \parallel BC$
Prove that: AD is a tangent to the circle passing through the points A, X, Y



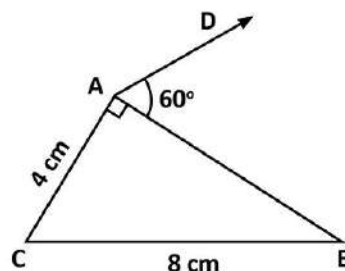
- 24** In the opposite figure:
A circle is drawn touching the sides of the triangle ABC, AB, BC, AC at D, E, F, AD = 5 cm, BE = 4 cm, CF = 3 cm.
Find the perimeter of ΔABC



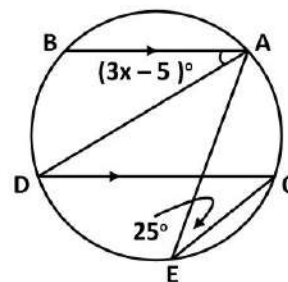
- 25** In the opposite figure:
M and N are two intersecting circles at A and B, $MN \cap AB = \{B\}$, $C \in BA$, $D \in$ the circle N, $m(\angle MND) = 125^\circ$, $m(\angle BCD) = 55^\circ$
Prove that: CD is a tangent to the circle N at D



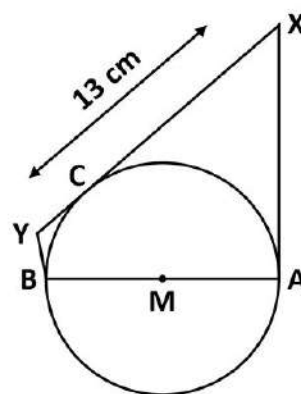
- 26** Using the givens in the figure:
Prove that: AD is a tangent to the circle passing through the vertices of ΔABC



- 27** In the opposite figure:
AB, CD are two parallel chords in a circle:
 $m(\angle BAD) = (3x - 5)^\circ$
 $m(\angle AEC) = 25^\circ$
Find: The value of X



- 28** In the opposite figure:
AB is a diameter in a circle M whose radius length is 5 cm.
If $C \in$ the circle M, a tangent to the circle is drawn at point C and cuts the two tangents of the circle at A, B in X, Y where $XY = 13$ cm.
Find: The area of the figure AX YB.



Second Geometry

Q1: Choose the correct answer

- 1 A chord of length 6 cm, is drawn in a circle of diameter length 10 cm, then the distance between the chord and the centre of the circle is
☐ a 3 cm ☒ b 4 cm ☐ c 5 cm ☐ d 2 cm
- 2 The centre of a circle is the origin, its radius length is 7 cm, which of the following points is not on the circle ?
☐ a (0, 7) ☐ b (0, -7) ☐ c (7, 0) ☒ d (2, 2)
- 3 If the diameter length of the circle M is 7 cm, MA = 4 cm, then A lies
☐ a inside the circle ☐ b on the circle ☒ c outside the circle ☐ d otherwise
- 4 It is impossible to draw a circle passing through the vertices of
☐ a a triangle ☒ b a rhombus ☐ c a square ☐ d a rectangle
- 5 The surface of the circle M $\cap$ the surface of the circle N = {A} and the radius length of one of them is 3 cm. and MN = 8 cm, then the radius length of the other circle equals cm
☒ a 5 ☐ b 6 ☐ c 11 ☐ d 16
- 6 If M, N are two touching circles internally, their radii lengths are 5 cm, 9 cm. , then MN = cm.
☐ a 14 ☒ b 4 ☐ c 5 ☐ d 9
- 7 The chord whose length is 8 cm. in a circle of radius length 5 cm. is at cm. distant from its centre.
☒ a 3 ☐ b 4 ☐ c 5 ☐ d 10



8 The number of symmetry axes of a circle is

- ☐ a zero ☐ b 1 ☐ c 2 ☒ d infinite number

9 If M is a circle of diameter length 6 cm, A is a point on the circle, then MA =

- ☒ a 3 cm ☐ b 4 cm ☐ c 5 cm ☐ d 6 cm

10 AB is a diameter of the circle whose centre is the origin point , if A = (2 , 0) , then B =

- ☐ a (2 , 2) ☐ b (0 , -2) ☒ c (-2 , 0) ☐ d (-2 , 2)

11 A circle of circumference 20π cm. then its area is π cm².

- ☐ a 10 ☒ b 100 ☐ c 200 ☐ d 400

12 The radius length of the circle whose centre is the origin point and passes through the point (3 ,4) equals length unit.

- ☐ a 3 ☐ b 4 ☒ c 5 ☐ d 7

13 The measure of the interior angle of the regular hexagon equals

- ☐ a 60° ☒ b 120° ☐ c 108° ☐ d 144°

14 The length of arc opposite to central angle of measure 120°, in a circle of radius r is

- ☐ a $\frac{1}{3}\pi r$ ☐ b πr ☒ c $\frac{2}{3}\pi r$ ☐ d $3\pi r$

15 The number of circles passing through three collinear points is

- ☒ a 0 ☐ b 1 ☐ c 3 ☐ d infinite number

16 M and N are two circles, their radii lengths are 9 cm. and 6 cm. , the two circles are distant if MN 15 cm

- ☒ a > ☐ b < ☐ c = ☐ d ≥



17 M and N are two circles touching externally, the radius length of the circle M = 4 cm, if MN = 7 cm, then the circumference of the circle N equals

- (a) 4π (b) 6π (c) 7π (d) π

18 Two circles, the lengths of their radii are 5 cm, 8 cm. are touching, then the distance between their centres

- (a) $]3, 13[$ (b) $]13, \infty[$ (c) $]0, 3[$ (d) $\{3, 13\}$

19 The line of centres of two intersecting circles is perpendicular to and bisects it

- (a) the diameter (b) the chord (c) the tangent (d) the common chord

20 A circle of circumference 6π cm. and the straight line L is distant from its centre by 3 cm. then the straight line L is

- (a) a diameter (b) a secant (c) a tangent (d) outside the circle

21 If the straight line L is a tangent to the circle M of diameter length 8 cm. , then the distance between L and the centre of the circle equals cm

- (a) 3 (b) 4 (c) 6 (d) 8

22 Lengths of two adjacent sides of a parallelogram are 7 cm, 5 cm, the longer height is 6 cm, then its area =

- (a) 35 (b) 42 (c) 30 (d) 18

23 The circumference of a circle M is 12π cm, the point A is in the plane of the circle. If MA = 5 cm, then the point A lies the circle.

- (a) outside (b) inside (c) on (d) at the centre of

24 The number of altitudes of the isosceles triangle is

- (a) zero (b) 1 (c) 3 (d) infinite



25 The point of concurrence of the medians of the triangle divides each median by the ratio from the base.

(a) 1 : 3

(b) 2 : 1

(c) 3 : 1

(d) 1 : 2

26 The number of circles which pass through three non-collinear points is

(a) zero

(b) 1

(c) 2

(d) 3

27 In ΔABC , if $(AB)^2 + (BC)^2 = (AC)^2$, then $\angle B$ is

(a) obtuse

(b) right

(c) acute

(d) straight

28 M, N are two touching externally circles, the lengths of their radii are 7 cm, 3 cm. , then MN = cm.

(a) 4

(b) 12

(c) 6

(d) 10

29 The greatest chord in a circle is 16 cm, then its circumference = cm

(a) 8π

(b) 4π

(c) 12π

(d) 16π

30 A circle has an area of $9\pi \text{ cm}^2$, and a line L is 3 cm away from its center, then the line L will be

(a) tangent to the circle

(b) secant to the circle

(c) outside the circle

(d) diameter

31 The circumcircle of a triangle has its center at the intersection of

(a) The bisectors of its internal angles

(b) Its altitudes

(c) The axes of symmetry of its sides

(d) The bisectors of its external angles

32 A chord of length 6 cm is drawn inside a circle with a diameter of 10 cm, then it is at cm from the center:

(a) 2

(b) 3

(c) 4

(d) 6



Q1: Choose the correct answer

- 1 The measure of an interior angle of regular hexagon is
 (a) 60° (b) 108° (c) 120° (d) 135°
- 2 If MA, MB are two perpendicular radii in a circle M, Area of $\Delta AMB = 18 \text{ cm}^2$, then radius of circle M = cm
 (a) 4 (b) 6 (c) 9 (d) 3
- 3 ABCD is a quadrilateral inscribed in a circle, $m(\angle A) = 70^\circ$. then $m(\widehat{BAD}) = \dots\dots\dots^\circ$.
 (a) 35 (b) 55 (c) 140 (d) 220
- 4 ABC is an equilateral triangle inscribed in a circle, then $m(\widehat{AB}) = \dots\dots\dots$.
 (a) 30° (b) 60° (c) 120° (d) 240°
- 5 The inscribed angle which is drawn in a semicircle is
 (a) acute (b) obtuse (c) straight (d) right
- 6 The measure of the central angle the measure of the inscribed angle subtended by the same arc.
 (a) half (b) twice (c) triple (d) equal
- 7 An arc in a circle, its length $= \frac{1}{3} \pi r$, then it is opposite to a central angle of measure
 (a) 30° (b) 60° (c) 120° (d) 240°
- 8 The circumference of a circle is 36 cm, then the measure of an arc of it with length 6 cm is
 (a) 30° (b) 60° (c) 120° (d) 90°



9 The length of the arc opposite to a central angle of measure 30° in a circle of circumference 36 cm. equals cm

(a) 18

(b) 9

(c) 3

(d) 4.5

10 The length of the arc that is opposite to a right inscribed angle in a circle whose circumference is 44 cm. equals cm.

(a) 22

(b) 11

(c) $\frac{22}{7}$

(d) $\frac{44}{7}$

11 In the opposite figure:

$BA \parallel CD$, $m(\angle B) = 50^\circ$

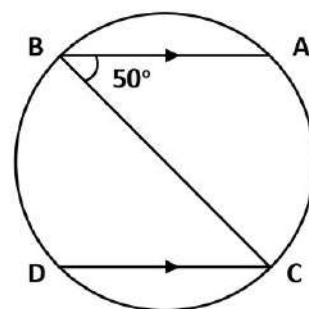
, then $m(\widehat{AC}) + m(\widehat{BD}) = \dots\dots\dots$

(a) 50°

(c) 150°

(b) 200°

(d) 180°



12 The number of common tangents of two circles which are one circle inside the other without touching is

(a) 3

(b) 2

(c) 1

(d) 0

13 The number of common tangents of two circles touching internally equals

(a) 3

(b) 2

(c) 1

(d) 0

14 The number of common tangents of two touching externally circles is

(a) 3

(b) 2

(c) 1

(d) 0

15 The number of tangents can be drawn from a point lying on a circle is

(a) zero

(b) 1

(c) 4

(d) infinite

16 The number of common tangents of two distant circles is

(a) 3

(b) 1

(c) 4

(d) 2



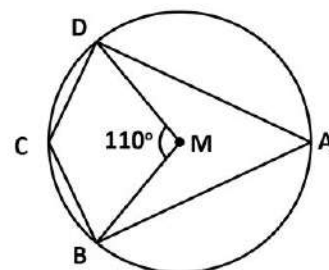
- 17 In the opposite figure:
If M is the centre of the circle
 $m(\angle BMD) = 110^\circ$
, then $m(\angle C) = \dots\dots\dots$

a 70°

b 90°

c 125°

d 135°



- 18 The sum of measures of two complementary angles is

a 45°

b 90°

c 180°

d 360°

- 19 If ABCD is a square drawn in a circle, then $m(\widehat{AB}) = \dots\dots\dots$

a 60°

b 90°

c 120°

d 180°

- 20 The measure of the inscribed angle drawn in a semicircle equals $^\circ$

a 360

b 180

c 90

d 120

- 21 Area of triangle whose base length 10 cm and height length 6 cm is cm^2

a 16

b 30

c 32

d 60

- 22 M, N, L are three touching externally circles two by two, their radii 5, 6 and 4 cm
then perimeter of $\Delta MNL = \dots\dots\dots$ cm.

a 15

b 30

c 40

d 60

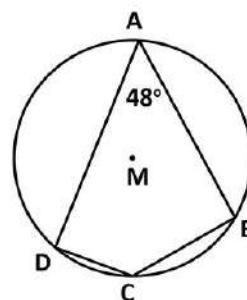
- 23 In the opposite figure:
If $m(\angle A) = 48^\circ$
, then $m(\widehat{BD})$ the major =

a 260°

b 265°

c 264°

d 262°



- 24 The inscribed angle subtended by a minor arc in the circle is

a acute

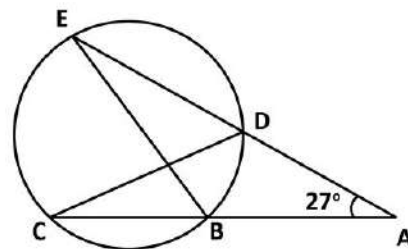
b obtuse

c straight

d right



- 25 In the opposite figure:
AD intersects the circle at D and E,
AB intersects, it at B and C
If $m(\angle A) = 27^\circ$, $AB = BE$, then $m(\angle CDE) = \dots\dots\dots$



- (a) 13.5° (b) 54° (c) 27° (d) 36°

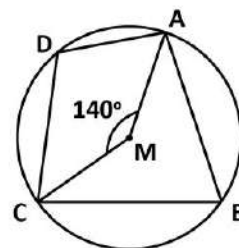
- 26 ABCD is a cyclic quadrilateral in which: $m(\angle A) = m(\angle C)$, then $m(\angle A) = \dots\dots\dots$

- (a) 60° (b) 90° (c) 120° (d) 180°

- 27 ABCD is a cyclic quadrilateral. If $m(\angle ACB) = 80^\circ$, then $m(\angle ADB) = \dots\dots\dots$

- (a) 40° (b) 80° (c) 100° (d) 160°

- 28 In the opposite figure :
In the circle M, if $m(\angle AMC) = 140^\circ$
, then $m(\angle ADC) = \dots\dots\dots$



- (a) 40° (b) 70°
(c) 110° (d) 140°

- 29 In the cyclic quadrilateral ABCD, if $m(\angle A) = 3m(\angle C)$, then $m(\angle A) = \dots\dots\dots$

- (a) 45° (b) 90° (c) 120° (d) 135°

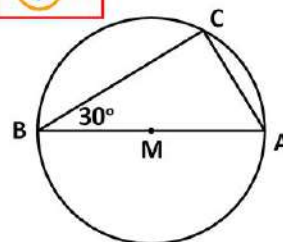
- 30 The two tangent-segments drawn from a point outside a circle are

- (a) parallel (b) perpendicular (c) equal in length (d) not equal in length

- 31 The number of the common tangents of the two touching externally circles is

- (a) zero (b) 1 (c) 2 (d) 3

- 32 In the opposite figure:
AB is a diameter of the circle M
, $m(\angle B) = 30^\circ$, $AC = 6$ cm.
, then $AB = \dots\dots\dots$ cm .



- (a) 3 (b) 6 (c) 9 (d) 12



33 The ratio between the measure of the inscribed angle and the measure of the central angle subtended by the same arc is

a) 2 : 1

b) 1 : 2

c) 2 : 2

d) 2 : 3

34 If the measure of a tangency angle is 50° , then the measure of the inscribed angle that shares the same arc is

a) 50° b) 100° c) 130° d) 150°

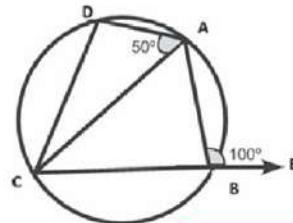
35 ABCD cyclic quadrilateral has $m(\angle A) = 2m(\angle C)$, then $m(\angle C) = \dots\dots\dots$

a) 30° b) 60° c) 120° d) 90°

36 If ABCD cyclic quadrilateral, then $m(\angle A) + m(\angle C) - 40^\circ = \dots\dots\dots$

a) 60° b) 140° c) 80° d) 180°

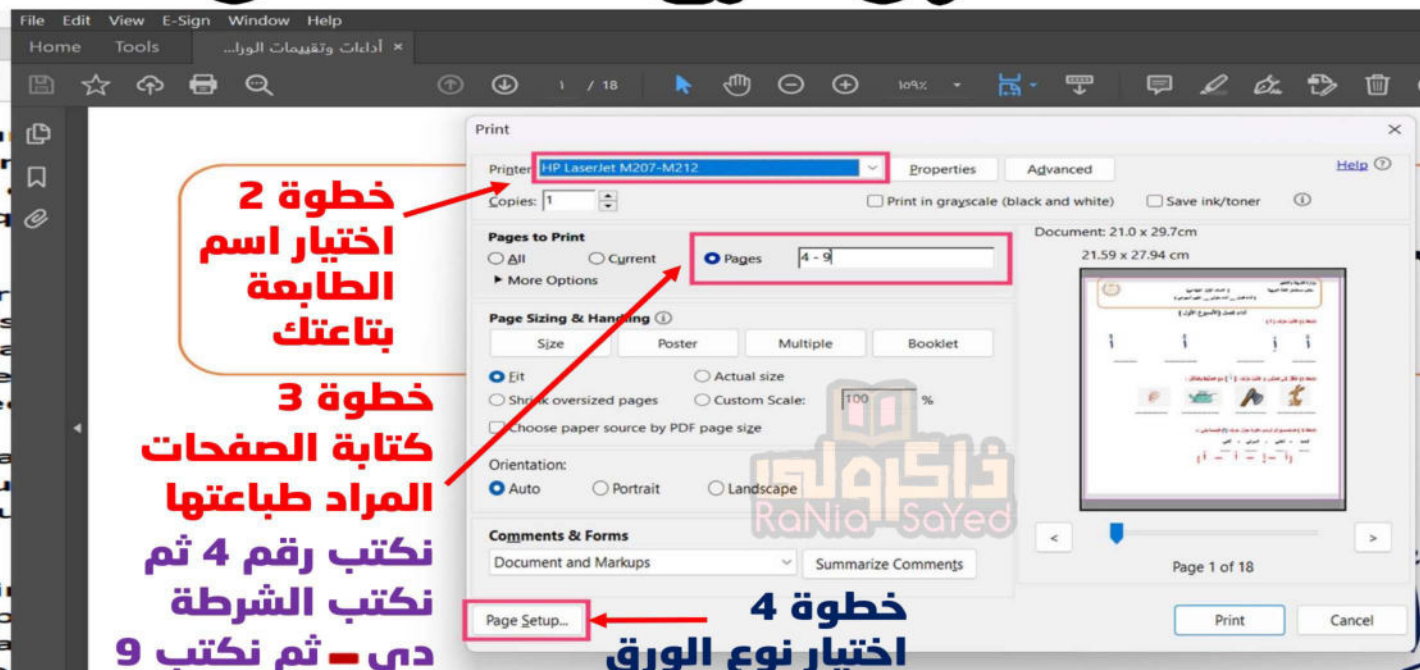
37 In the opposite figure:
 $E \in BC$, $m(\angle ABE) = 100^\circ$,
 $m(\angle CAD) = 50^\circ$,
 then $m(\angle ACD) = \dots\dots\dots$

a) 50° b) 100° c) 80° d) 30° 

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



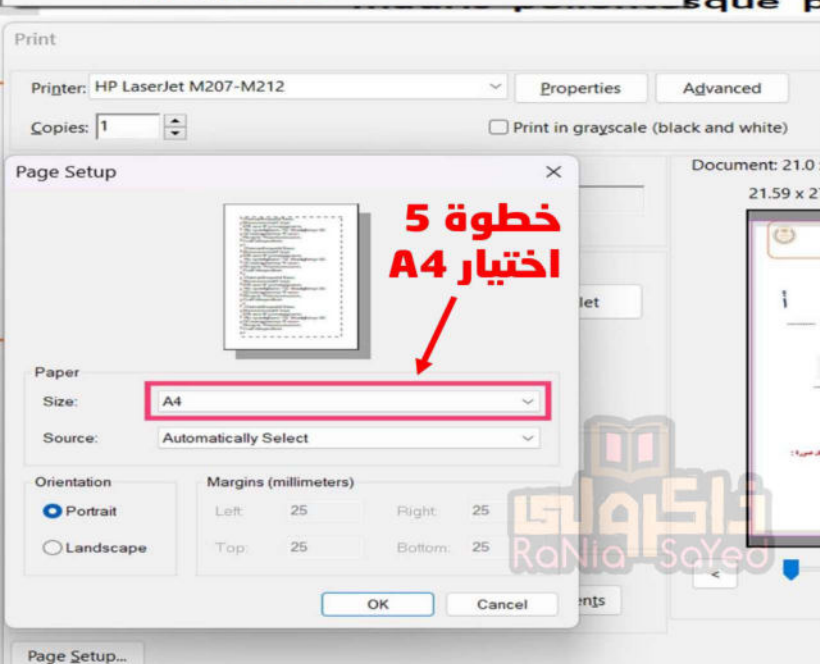
خطوة 1



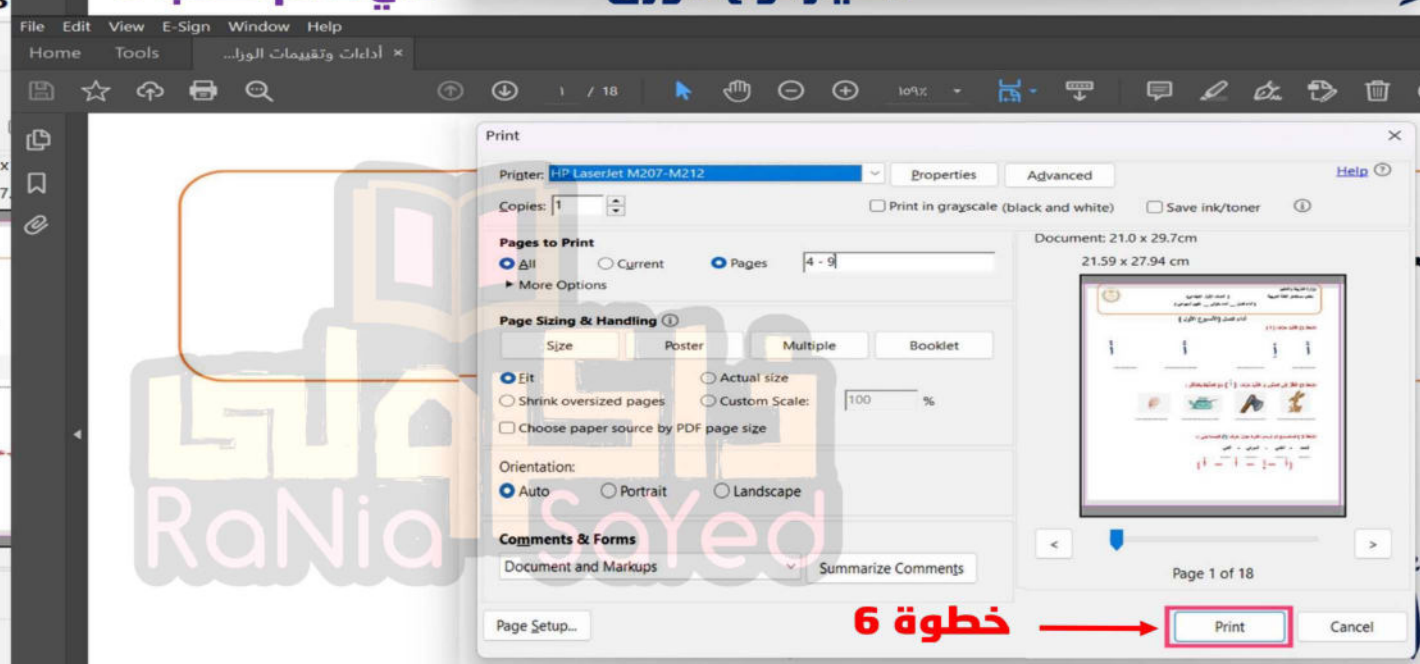
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6

حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

الترم الثاني



Prep 3

final revision

FIRST:ALGEBRA

Choose the correct answer:

1)	If: $n_1(x) = \frac{x+2}{x-1}$, $n_2(x) = \frac{x-5}{x+3}$, then the common domain of the two function n_1 and n_2 is
	($\mathbb{R} - \{1, -2\}$ or $\mathbb{R} - \{-3, 5\}$ or $\mathbb{R}$ or $\mathbb{R} - \{1, -3\}$)
2)	The set of zeroes of the function f where $f(x) = 2x^2$ is
	($\{0\}$ or $\mathbb{R} - \{0\}$ or $\mathbb{R} - \{2\}$ or $\mathbb{R}$)
3)	If $(2, 1)$ is a solution of the equation: $2x + ay = 6$, then $a =$
	(2 or 6 or 1 or 3)
4)	If A and B are two mutually exclusive events, then $P(A \cap B) =$
	(1 or 0 or $\emptyset$ or $\frac{1}{2}$)
5)	The point of intersection of the two straight lines which equations are $X + y = 3$ and $X - y = 1$ is
	((1, 2) or (4, -1) or (2, 1) or (5, -2))
6)	If A and B are two events from the sample space of a random experiment $P(B) = 0.7$ and $P(A) = 0.2$ and $A \subset B$, then $P(A \cup B) =$
	(zero or 0.2 or 0.7 or 0.5)
7)	If the sum of two positive numbers is 9 and their product is 8, then the two numbers are
	(2, 7 or 3, 6 or 4, 5 or 1, 8)
8)	The S.S. of the two equations: $x + y = 0$, $x - 2 = 0$ in $\mathbb{R} \times \mathbb{R}$ is
	{(0, 2)} or {(2, 2)} or {(-2, 2)} or {(2, -2)}

9)	If a regular dice is rolled once then the probability of getting an even number equal	(3 or 1 or $\frac{1}{2}$ or $\frac{1}{3}$)
10)	The simplest form of the function f where: $f(x) = \frac{2x^2 + x}{x}$ and $x \neq 0$	($3x$ or $2x^2 + 1$ or $x^2 + 1$ or $2x + 1$)
11)	If: $p(A) = \frac{1}{3}$, then $p(\bar{A}) = \dots\dots\dots$	($\frac{1}{3}$ or $\frac{2}{3}$ or 1 or $\frac{1}{2}$)
12)	If the domain of the function: $n(x) = \frac{1}{x} + \frac{9}{x+b}$ is $\mathbb{R} - \{0, 4\}$, than $b = \dots\dots\dots$	(0 or 4 or -4 or 3)
13)	If A and B are mutually exclusive events and if $P(A) = \frac{1}{3}$, $P(A \cup B) = \frac{7}{12}$, then $P(B) = \dots\dots\dots$	($\frac{1}{3}$ or $\frac{1}{4}$ or $\frac{1}{2}$ or $\frac{2}{3}$)
14)	The set of zeroes of f where: $f(x) = -3x$ is	($\{0\}$ or $\{-3\}$ or $\{-3, 0\}$ or $\mathbb{R}$)
15)	If A and B are two events from S where $B \subset A$, then $P(A \cap B) = \dots\dots\dots$	(zero or $P(B)$ or $P(A)$ or $P(A-B)$)
16)	The solution set of the two equations: $x + 3y = 4$, $3y + x = 1$ is	($\{3, 1\}$ or $\{1, 3\}$ or $\emptyset$ or $\{1, 0\}$)
17)	If: $P(A) = P(\bar{A})$, then $P(A) = \dots\dots\dots$	(zero or 1 or $\frac{1}{2}$ or $\frac{1}{3}$)

18)	The domain of the function $n : n(x) = \frac{x}{x^2 + 9}$ is ($\mathbb{R}$ or $\mathbb{R} - \{3\}$ or $\mathbb{R} - \{-3\}$ or $\mathbb{R} - \{3, -3\}$)
19)	If: $n(x) = \frac{3}{x+l}$ and the domain of the function is $\mathbb{R} - \{-2\}$, than $l = \dots\dots\dots$ (-2 or 3 or 2 or -3)
20)	If A is an event of the sample space of a random experiment and $P(A) = P(\bar{A})$, then $P(A) = \dots\dots\dots$ (1 or zero or $\frac{1}{2}$ or $\emptyset$)
21)	The number of the solutions of the two equations: $X - 2y = 2$ and $3X - 6y = 6$ is (1 or 2 or 3 or an infinite)
22)	If: $x = 3$ is a root of the equation: $x^2 + mx = 3$, then $m = \dots\dots\dots$ (-1 or -2 or 2 or 1)
23)	If A and b are two events, $A \subset B$, $P(A \cap B) = \dots\dots\dots$ (zero or $P(A)$ or $P(B)$ or $P(A \cup B)$)
24)	If : $n(x) = \frac{x-3}{x+3}$, then the domain of $n^{-1}(x) = \dots\dots\dots$ ($\mathbb{R}$ or $\mathbb{R} - \{-3\}$ or $\mathbb{R} - \{3\}$ or $\mathbb{R} - \{3, -3\}$)
25)	The set of zeroes of the function $f : f(x) = \frac{x^2 - 4}{x^2 - 5x + 6}$ is ($\{-2\}$ or $\{2, 3\}$ or $\{2, -2\}$ or $\{2, -2, 3\}$)
26)	The ordered pair which satisfy the two equations: $xy = 2$, $x - y = 1$ is ($(1, 2)$ or $(2, 1)$ or $(1, 1)$ or $(3, 1)$)

27)	The simplest form of the function $f : f(x) = \frac{5-x}{x-5}$, $x \neq 5$ is (5 or 0 or -1 or 1)
28)	If A and B are two events, $P(A) = P(\bar{A})$, then $P(A) = \dots\dots\dots$ (0 or $\frac{1}{2}$ or 1 or $\frac{1}{4}$)
29)	The common domain of functions: $f_1(x) = \frac{1}{x-1}$, $f_2(x) = \frac{1}{x^2+4}$ is..... ($\mathbb{R}$ or $\mathbb{R} - \{1\}$ or $\mathbb{R} - \{1, 2\}$ or $\mathbb{R} - \{1, 2, -2\}$)
30)	If: $P(A) = \frac{2}{3}$, $P(B) = \frac{1}{2}$, $P(A \cap B) = \frac{1}{3}$, then $P(A \cup B) = \dots\dots\dots$ ($\frac{5}{6}$ or $\frac{1}{3}$ or $\frac{1}{2}$ or $\frac{1}{4}$)
31)	If: $P(A) = P(\bar{A})$, then $P(A) = \dots\dots\dots$ (zero or $\frac{1}{2}$ or $\frac{1}{3}$ or 1)
32)	If the two equations: $x + 4y = 7$, $3x + ky = 21$ have infinite solutions k = (4 or 12 or 7 or 21)
33)	The set of zeros of f where $f(x) = x^2 - 6x + 9$ is ($\mathbb{R}$ or $\{2, 3\}$ or {zero} or $\{3\}$)
34)	The point of intersection of the two straight lines: $3x + 5y = 0$, $5x - 3y = 0$ is (0, 0) or (-3, 5) or (3, 5) or (-5, 3))
35)	If : A, B are two events in sample space of random experiment and $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, $P(A \cup B) = \frac{5}{6}$, then $B \subset A$ or B complement A A, B mutually exclusive or $A \subset B$.

36)	The two numbers whose sum 7 and their product 12 are (2, 5 or 3, 4 or 2, 6 or 1, 6)
37)	If A and B are two events of the sample space of a random experiment and if $P(A) = 0.7$, $P(A - B) = 0.5$, then $P(A \cap B) = \dots\dots\dots$ (0.2 or 0.5 or 0.7 or 0.3)
38)	If A and B are two mutually exclusive events from a sample space, then $P(A \cap B) = \dots\dots\dots$ ($\frac{1}{2}$ or 1 or zero or 3)
39)	If the algebraic fraction $n : n(x) = \frac{x}{x-2}$ has a multiplicative inverse, then the domain of $n(x)$ is ($\mathbb{R}$ or $\mathbb{R} - \{0\}$ or $\mathbb{R} - \{2\}$ or $\mathbb{R} - \{0, 2\}$)
40)	The S.S. of the two equations: $x - y = 0$ and $xy = 4$ in $\mathbb{R} \times \mathbb{R}$ is {(0, 0)} or {(2, 2)} {(-2, -2)} or {(2, 2), (-2, -2)}
41)	The set of zeros of the function f where: $f(x) = \frac{(x-5)(x-4)}{x^2+16}$ is..... {(5, 4)} or {5} or {4, -4} or $\mathbb{R} - \{4, -4\}$
42)	If : $x \neq 5$, then $\frac{x-5}{5-x} = \dots\dots\dots$ (1 or -1 or zero or 5)
43)	The common domain of the two fractions: $n_1(x) = \frac{x}{3}$ and $n_2(x) = \frac{3}{x}$ is ($\mathbb{R} - \{0, 3\}$ or $\mathbb{R} - \{3\}$ or $\mathbb{R} - \{0\}$ or $\mathbb{R}$)
44)	The S.S. in $\mathbb{R} \times \mathbb{R}$ of the two equations: $x + 3y = 4$ and $x + 3y = 1$ is {(1, 3)} or {(0, 0)} or $\emptyset$ or {(4, 1)}

45)	$n(x) = \frac{x-1}{x}$ has multiplicative inverse in the domain $(\mathbb{R} - \{0\}$ or $\mathbb{R} - \{1\}$ or $\mathbb{R} - \{0, 1\}$ or $\{0, 1\})$
46)	One of the solutions for the equation: $2x - y = 1$ is $(2, 1)$ or $(1, 2)$ or $(2, 3)$ or $(0, 0)$
47)	If the regular coin is tossed once, then the probability of getting head and tail together equal $(0\%$ or 25% or 50% or $100\%)$
48)	If $A \subset B$, then $P(A \cap B) = \dots\dots\dots$ $(0$ or $P(A)$ or $P(B)$ or $P(A \cap B)$
49)	The simplest form of the function n : $n(x) = \frac{x^3 - x}{x}$, $x \neq 0$ is $n(x) = \dots\dots\dots$ $(x^2$ or $x^2 - 1$ or $x^2 - x$ or $x^3 - 1)$
50)	The domain of the function $f : f(x) = \frac{x-2}{x^2-4}$ is $\{-2, 2\}$ or $\mathbb{R} - \{2\}$ or $\mathbb{R} - \{-2\}$ or $\mathbb{R} - \{-2, 2\}$
51)	If $Z(f) = \{2\}$ and $f(x) = x^3 + m$, then $m = \dots\dots\dots$ $(-8$ or 8 or 2 or $-2)$
52)	One of the solutions for the two equation: $x - y = 3$, $xy = 4$ is $(1, 4)$ or $(2, -1)$ or $(4, 1)$ or $(1, -2)$
53)	The S.S. in $\mathbb{R} \times \mathbb{R}$ of the two equations: $y - 3 = 0$ and $x + y = 0$ is $\{3, 3\}$ or $\{(-3, 3)\}$ or $\{(3, 0)\}$ or $\{(0, 3)\}$

54)	If A and B are two events in the sample space of a random experiment and $P(A) = 0.7$, $P(A \cap B) = 0.2$, then $P(A - B) = \dots\dots\dots$ (0.5 or 0.9 or 0.7 or 0.2)
55)	If : $n(x) = \frac{x-5}{x-2}$, then the domain of $n^{-1} = \dots\dots\dots$ {2, 5} or $\mathbb{R} - \{2\}$ or $\mathbb{R} - \{5\}$ or $\mathbb{R} - \{2, 5\}$
56)	The solution set of the two equations : $x - y = 0$, $xy = 9$ is $\{(-3, 3)\}$ or $\{(3, 3), (-3, -3)\}$ $\{(0, 0)\}$ or $\{(3, -3)\}$
57)	The set of zeros of the function f in $\mathbb{R}$ where : $f(x) = \frac{x+7}{4}$ is $\{-7\}$ or $\{-4\}$ or $\mathbb{R}$ or $\emptyset$
58)	If the probability that one student succeeds in mathematics exam = 0.6 then the probability that he fails in it equal = (1 or 0 or 0.4 or 0.6)
59)	The S.S. in of the two equations: $x + y = 0$, $y = 4$ in $\mathbb{R} \times \mathbb{R}$ is..... $\{(4, 4)\}$ or $\{(0, 4)\}$ or $\{(-4, 4)\}$ or $\{(4, -4)\}$
60)	The two straight lines: $x + 3 = 0$, $y = 4$ are intersected in quadrant. (third or fourth or first or second)

1)	(a) Find : $n(x)$ in its simplest form showing the domain of n where: $n(x) = \frac{3x-4}{x^2-5x+6} + \frac{2x+6}{x^2+x-6}$ (b) Find algebraically the S.S. in $\mathbb{R} \times \mathbb{R}$ of the two equations: $x - 3y = 6$ and $2x + y = 5$
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2)	(a) Find the solution set in $\mathbb{R}$ of the equation : $x^2 - 5x + 3 = 0$ approximating the roots to the nearest tenth. (b) The perimeter of a rectangle is 14 cm. and its area 12 cm.² Find each of its two dimensions.
3)	(a) If: $n(x) = \frac{x^2 + x + 1}{x^2 - 9} \div \frac{x^3 - 1}{x^2 - 4x + 3}$, then find $n(x)$ in its simplest form showing the domain of n. (b) Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations: $x + y = 3$ and $xy + y^2 = 6$
4)	(a) If A and B are two events from the sample space of a random experiment , $P(A) = 0.7$, $P(B) = 0.4$ and $P(A \cap B) = 0.2$, then find (1) $P(\bar{A})$ (2) $P(A \cup B)$ (b) Graph the quadratic function f where $f(x) = x^2 - 4x + 3$, $x \in [-1, 5]$, then from the graph deduce : 1) The coordinates of the vertex of the curve. 2) The minimum value of the function. 3) The S.S. in $\mathbb{R}$ of the equation : $x^2 - 4x + 3 = 0$
5)	(a) Find algebraically the S.S. of the two equations: $2x - y + 3 = 0$ and $x + 2y + 4 = 0$ in $\mathbb{R} \times \mathbb{R}$ (b) The difference between two numbers is 5 and the product of them is 36 find the two numbers.

6)	(a) If A and B are two events in the sample space of a random experiment and $P(A) = 0.6$, $P(B) = 0.3$, $P(A \cap B) = 0.2$, then find: 1) $P(A \cup B)$ 2) $P(A - B)$ (b) Simplify to its simplest form showing the domain of n where : $n(x) = \frac{3x}{x^2 - 2x} - \frac{12}{x^2 - 4}$
7)	(a) Find the S.S. of the two equations : $3x + 4y = 24$ and $x - 2y = -2$ in $\mathbb{R} \times \mathbb{R}$ (b) Find by using the general formula the solution set of the equation : $3x^2 - 6x + 1 = 0$
8)	(a) Find : n (x) in the simplest form showing the domain where : $n(x) = \frac{x^2 - 3x + 2}{x^2 - 49} \div \frac{x - 2}{x + 7}$ (b) Graph the function $f : f(x) = x^2 - 1$ taking $x \in [-2, 2]$ and from the graph deduce : 1) The coordinates of the vertex of the curve. 2) The minimum or maximum value of the function. 3) The two roots of the equation $f(x) = 0$
9)	(a) Find the S.S. of the equation : $x^2 - 2x - 4 = 0$ in $\mathbb{R}$ approximating the result to the nearest tenth. (b) Find n(x) in the simplest form showing the domain of n where: $n(x) = \frac{x^2 + x + 1}{x} \times \frac{x^2 - x}{x^3 - 1}$

10)	(a) Find graphically, then verify algebraically the S.S. in $\mathbb{R} \times \mathbb{R}$ to the equations: $y = x + 4$ and $x + y = 4$ (b) Put in the simplest form with determining the domain of the function $n(x) = \frac{x^2 - 4}{x^2 + 3x + 2} - \frac{x^2 - 2x}{x^2 - x - 2}$ then, find $n(1)$
11)	(a) 12 cards numbered from 1 to 12, if a card is picked randomly, what's the probability of getting an odd number divisible by 3 (b) Find algebraically the solution set of the two equations: $y - x = 2$, $x^2 + x y - 4 = 0$
12)	(a) Represent graphically the function $f: f(x) = 4 - x^2$ on the interval $[-3, 3]$ and from the drawing deduce the : 1) Roots of the equation : $f(x) = 0$ 2) Equation of symmetric axis. (b) A rectangle with a length more than its width by 4 cm. If the perimeter of the rectangle is 28 cm., find area of the rectangle.
13)	(a) Find in $\mathbb{R} \times \mathbb{R}$ the S.S. of the two equations : $y - x = 3$ and $x^2 - 2x + 3y = 15$ (b) If : $n(x) = \frac{x^2 - 2x + 1}{x^3 - 1} \div \frac{x - 1}{x^2 + x + 1}$, then find $n(x)$ in the simplest form showing the domain of n
14)	(a) Find the solution set of the equation by using the general rule rounding the result to the nearest two decimal digits : $3x^2 - 5x + 1 = 0$ (b) A rectangle whose length is greater than its width by 3 cm., if twice its length is smaller than four times its width by 2 cm., find length and width of the rectangle.

15)	(a) Find the solution set of the two equations: $2x - y = 3, x + 3y = 5$ algebraically (b) Find $n(x)$ in the simplest form showing its domain where : $n(x) = \frac{2x + 6}{x^2 + x - 6} + \frac{3x - 4}{x^2 - 5x + 6}$
16)	(a) Represent graphically the function : $f(x) = x^2 + 3$, where $x \in [-3, 3]$ and from the drawing deduce : 1) The S.S. of the equation $f(x) = 0$ 2) The equation of the symmetry axis. (b) If A and B are two events of a sample space of a random experiment and $P(A) = \frac{4}{9}, P(B) = \frac{1}{3}, P(A \cup B) = \frac{2}{3}$ Find : $P(A \cap B)$
17)	(a) Find $n(x)$ in the simplest form showing the domain of n where: $n(x) = \frac{x^2 - 4}{x^2 + 3x + 2} \div \frac{x^2 - 2x}{x^2 - x - 2}$, then find $n(-1)$ if possible. (b) Two acute angles in a right-angled triangle, the difference between their measure 40°, find the measure of each angle.
18)	(a) Find the S.S. of the two equations : $x + y = 7$ and $x^2 + y^2 = 25$ in $\mathbb{R} \times \mathbb{R}$ (b) Find the solution set of the equation (using formula) to: $x(x + 2) = 1$, rounding the results to two decimal places.
19)	(a) Find the solution set for each pair of the following two equations algebraically or graphically : $x - 2y = 0$ and $2x - y = 3$ (b) Find $n(x)$ in the simplest form showing the domain of n where: $n(x) = \frac{3}{12x^2 - 3} - \frac{2x}{4x^2 - 2x}$ then find $n(0)$ if possible.

20)	(a) A bag contains 20 identical card numbered from 1 to 20 a card is randomly drawn. Find the probability that number on the card is : (1) divisible by 3 (2) an odd and divisible by 5 (b) Draw the graphical form of the function f where : $f(x) = x^2 - 2x - 3$ in the interval $[-2, 4]$ and from the drawing find: 1) The vertex of the curve. 2) The maximum value or the minimum value of the function. 3) The two roots of the equation $f(x) = 0$
21)	(a) Find graphically or algebraically the S.S. of the two equations : $x + y = 4, 2x - y = 2$ in $\mathbb{R} \times \mathbb{R}$ (b) The sum of two integers is 9 and the difference between their squares is 27 find the two numbers.
22)	(a) Find the function n in its simplest form showing its domain where : $n(x) = \frac{x-1}{x^2-1} \div \frac{x^2-5x}{x^2-4x-5}$ (b) Find the S.S. of two equations : $x - y = 1, x^2 + y^2 = 13$
23)	(a) Using formula find SS. of : $x^2 - 4x + 1 = 0$, approximated to two decimals. (b) If : $n(x) = \frac{x^2 - 2x + 4}{x^3 + 8} + \frac{x^2 - x - 2}{x^2 - 4}$ Put $n(x)$ in the simplest form showing its domain.
24)	(a) A box contains 20 symmetrical balls , 8 red 7 white and the rest is green one ball was drawn randomly find probability that it was. 1) Red 2) White or green 3) Not white (b) Draw the graph of function f where $f(x) = x^2 - 4x + 3, x \in [0, 4]$ From the graph find : 1) The maximum or minimum value 2) The S.S. of $x^2 - 4x + 3 = 0$

25)	(a) If : $n(x) = \frac{x^2 - 1}{x^2 + 3x + 2} \div \frac{x^2 - x}{x^2 + 2x}$, then find $n(x)$ in the simplest form showing the domain of n (b) Find in $\mathbb{R} \times \mathbb{R}$ graphically and algebraically the S.S. of the two equations : $y = x + 1$ and $y = 2x - 1$
26)	(a) A rectangle is with a length more that its width by 2 cm. If the perimeter of the rectangle is 32cm. Find the area of the rectangle. (b) If A and B are two events of the sample space of a random experiment , $P(A) = 0.5$ and $P(A \cup B) = 0.8$ and $P(B) = x$,then find the value of x if : 1) $P(A \cap B) = 0.1$ 2) $A \subset B$
27)	(a) Graph the function f where : $f(X) = x^2 - 4x + 3$, on the interval $[-1, 5]$ and from the graph find : 1)The minimum value of the function. 2)The equation of the axis of symmetry. 3)The S.S. of the equation $f(X) = 0$ (b) Find The S.S. of the equation : $3x^2 = 5x - 1$ approximating the result to the nearest two decimal digits.
28)	(a) Find in $\mathbb{R} \times \mathbb{R}$ the S.S. of the two equations : $y - x = 2$ and $x^2 + xy - 4 = 0$ (b) Find $n(x)$ in the simplest form showing the domain of n : $n(x) = \frac{3x - 15}{x^2 - 8x + 15} - \frac{x^2 - 3x - 18}{9 - x^2}$

29)	(a) Find $n(x)$ in the simplest form showing the domain of n where: $n(x) = \frac{x}{x^2 + 2x} - \frac{x-2}{4-x^2}$, then find : $n(-2)$ if possible. (b) A rectangle whose diagonal length 5 cm. and perimeter 14 cm. find its two dimensions.
30)	(a) Find $n(x)$ in the simplest form identifying the domain , where : $n(x) = \frac{x^2 - 49}{x^3 - 8} \div \frac{x+7}{x-2}$ (b) Find the solution set for the two equations: $x - y = 0, xy = 9$
31)	(a) Find graphically or algebraically the S.S. in $\mathbb{R} \times \mathbb{R}$ of the two equation : $2x + y = 1, x + 2y = 5$ (b) Find the solution set of : $x^2 - x = 4$, using the general rule. Given that $\sqrt{17} = 4.12$
32)	(a) Draw the graphical representation of the function f where : $f(x) = x^2 - 2x$ in the interval $[-1, 3]$ and from the drawing find the roots of the equation $f(x) = 0$ (b) If A and B are two events in sample space of a random experiment where $P(A) = \frac{3}{8}, P(B) = \frac{1}{2}, P(A \cup B) = \frac{5}{8}$ Find : $P(\bar{A})$ and $P(A \cap B)$
33)	(a) Find $n(x)$ in the simplest form determining the domain of n where : $n(x) = \frac{x^2 - 2x + 4}{x^3 + 8} + \frac{x^2 - x - 2}{x^2 - 4}$ (b) A rectangle whose length exceeds width by 4 cm. , if the perimeter of the triangle is 28 cm. Find its area.

34)	(a) Find in $\mathbb{R} \times \mathbb{R}$ the S.S. of the two equations : $x - 2y = 4$ and $3x + y = 5$ (b) Find the solution set for the two equations : $x = y + 2$, $x^2 + xy = 0$
35)	(a) Find the solution set of the equations : $x^2 + x = 3$ rounding the result to one decimal digit. (b) Find $n(x)$ in the simplest form identifying its domain where : $n(x) = \frac{x^3 - 8}{x^2 + x - 6} \div \frac{x^2 + 2x + 4}{x - 3}$
36)	(a) Represent graphically the function f where : $f(x) = (x - 2)^2$, $x \in \mathbb{R}$ where $x \in [-1, 5]$ and from the drawing find the roots of the equation $f(x) = 0$ (b) If A and B are two events from a sample space of a random experiment and $P(A) = 0.5$, $P(A \cup B) = 0.9$ and $P(B) = x$, then find the value of x if A and B are mutually exclusive events.
37)	(a) Find $n(x)$ in the simplest form showing the domain of n : $n(x) = \frac{x^2 + 2x - 3}{x + 3} \div \frac{x^2 - 1}{x + 1}$ (b) Find the S.S. of the two equations : $y - x = 2$, $x^2 + xy - 4 = 0$ in $\mathbb{R} \times \mathbb{R}$
38)	(a) A number formed from two digits their sum is 11 and twice the units digit exceeds three times the tens digit by 2 find the number. (b) Find the solution set of the equation : $x^2 - 4x + 1 = 0$ in $\mathbb{R}$ rounding the result to two decimal place.

39)	(a) Find $n(x)$ in the simplest form identifying the domain , where : $n(x) = \frac{x}{x^2 + 2x} + \frac{x-2}{x^2 - 4}$ (b) Find the solution set of the two equations : $x + y = 7, 5x - y = 5$
40)	(a) A bag contains 20 identical cards numbered from 1 to 20 , a card is randomly drawn , find the probability that the number is : 1) divisibly by 5 2) divisibly by both numbers 5 or 7 (b) Represent the quadratic function $f(x) = x^2 - 4$, graphically in the interval $[-2, 2]$ and from the graph find : 1)The minimum or maximum value of the function. 2)The set of zeros of the function f

The answer

1)	$\mathbb{R} - \{1, -3\}$	2)	$\{0\}$	3)	2
4)	0	5)	$(2, 1)$	6)	0.7
7)	1, 8	8)	$\{(2, -2)\}$	9)	$\frac{1}{2}$
10)	$2x + 1$	11)	$\frac{2}{3}$	12)	-4
13)	$\frac{1}{4}$	14)	$\{0\}$	15)	$P(B)$
16)	$\emptyset$	17)	$\frac{1}{2}$	18)	$\mathbb{R}$
19)	2	20)	$\frac{1}{2}$	21)	an infinite
22)	-2	23)	$P(A)$	24)	$\mathbb{R} - \{3, -3\}$
25)	$\{-2\}$	26)	$(2, 1)$	27)	-1
28)	$\frac{1}{2}$	29)	$\mathbb{R} - \{1\}$	30)	$\frac{5}{6}$
31)	$\frac{1}{2}$	32)	12	33)	$\{3\}$
34)	$(0, 0)$	35)	A, B mutually exclusive	36)	3, 4
37)	0.2	38)	ZERO	39)	$\mathbb{R} - \{2\}$
40)	$\{(2, 2), (-2, -2)\}$	41)	$\{5, 4\}$	42)	-1
43)	$\mathbb{R} - \{0\}$	44)	$\emptyset$	45)	$\mathbb{R} - \{0, 1\}$
46)	$(2, 3)$	47)	0%	48)	$P(A)$
49)	$x^2 - 1$	50)	$\mathbb{R} - \{-2, 2\}$	51)	-8
52)	$(4, 1)$	53)	$\{(-3, 3)\}$	54)	0.5
55)	$\mathbb{R} - \{2, 5\}$	56)	$\{(3, 3), (-3, -3)\}$	57)	$\{-7\}$
58)	0.4	59)	$\{(-4, 4)\}$	60)	second

$$1) (a) n(x) = \frac{3x-4}{(x-3)(x-2)} + \frac{2(x+3)}{(x-2)(x+3)}$$

$\therefore$ the domain of $n = \mathbb{R} - \{3, 2, -3\}$

$$, n(x) = \frac{3x-4}{(x-3)(x-2)} + \frac{2}{x-2}$$

$$= \frac{3x-4+2x-6}{(x-3)(x-2)} = \frac{5x-10}{(x-3)(x-2)}$$

$$= \frac{5(x-2)}{(x-3)(x-2)} = \frac{5}{x-3}$$

$$(b) x - 3y = 6 \quad (1)$$

$$, 2x + y = 5 \quad \text{i.e. } 6x + 3y = 15 \quad (2)$$

$\therefore$ Adding (1) and (2) : $\therefore 7x = 21$

$\therefore x = 3$, substituting in (1)

$$\therefore 3 - 3y = 6 \quad \therefore -3y = 3$$

$$\therefore y = -1$$

$\therefore$ the S.S. = $\{(3, -1)\}$

$$3)(a) n(x) = \frac{x^2+x+1}{(x-3)(x+3)} + \frac{(x-1)(x^2+x+1)}{(x-1)(x-3)}$$

$\therefore$ The domain of $n = \mathbb{R} - \{3, -3, 1\}$

$$n(x) = \frac{x^2+x+1}{(x-3)(x+3)} \times \frac{(x-1)(x-3)}{(x-1)(x^2+x+1)}$$

$$= \frac{1}{x+3}$$

$$(b) \therefore xy + y^2 = 6 \quad \therefore y(x+y) =$$

$$, \therefore x + y = 3 \quad \therefore 3y = 6$$

$$\therefore y = 2 \quad \therefore x = 1$$

$\therefore$ The S.S. = $\{(1, 2)\}$

$$2) (a) \therefore x^2 - 5x + 3 = 0$$

$$\therefore a = 1, b = -5 \text{ and } c = 3$$

$$\therefore x = \frac{5 \pm \sqrt{(-5)^2 - 4 \times 1 \times 3}}{2 \times 1}$$

$$\therefore x \approx 4.3 \quad \text{or } x \approx 0.7$$

$\therefore$ the S.S. = $\{4.3, 0.7\}$

(b) Let the length be x cm. and the width be y cm.

$$\therefore 2(x+y) = 14 \quad \therefore x+y = 7$$

$$\therefore x = 7 - y \quad (1)$$

$\therefore xy = 12$, substituting by (1)

$$\therefore (7-y)y = 12 \quad \therefore 7y - y^2 = 12$$

$$\therefore y^2 - 7y + 12 = 0$$

$$\therefore (y-3)(y-4) = 0$$

$$\therefore y = 3, \text{ from (1) : } \therefore x = 4$$

$$\text{or } y = 4, \text{ from (1) : } \therefore x = 3$$

$\therefore$ The two dimensions are 3 cm.

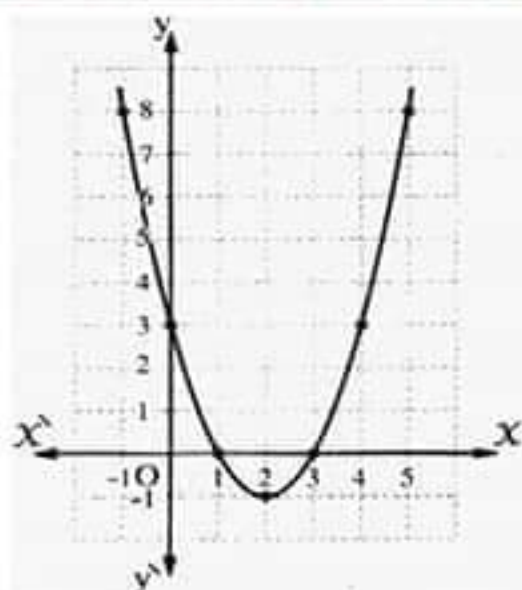
and 4 cm.

4) (a) (1) $P(\bar{A}) = 1 - P(A) = 1 - 0.7 = 0.3$

(2) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
 $= 0.7 + 0.4 - 0.2 = 0.9$

(b) $f(x) = x^2 - 4x + 3$

X	-1	0	1	2	3	4	5
y	8	3	0	-1	0	3	8



From the graph:

- The vertex point is $(2, -1)$
- The minimum value is -1

The S.S. of the equation: $x^2 - 4x + 3 = 0$
 is $\{1, 3\}$

5) (a) $2x - y = -3$ (1), $x + 2y = -4$

i.e. $2x + 4y = -8$ (2)

Subtracting (1) from (2): $\therefore 5y = -5$

$\therefore y = -1$ Subtracting in (1)

$\therefore x = -2$ $\therefore$ The S.S. = $\{(-2, -1)\}$

(b) Let the two numbers be x and y where $x > y$

$\therefore x - y = 5$ i.e. $x = 5 + y$ (1)

, $xy = 36$, from (1):

$\therefore (5 + y)y = 36$ $\therefore 5y + y^2 = 36$

$\therefore y^2 + 5y - 36 = 0$ $\therefore (y + 9)(y - 4) = 0$

$\therefore y = -9$ and hence $x = -4$

or $y = 4$ and hence $x = 9$

6) (a) (1) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$= 0.6 + 0.3 - 0.2 = 0.7$

(2) $P(A - B) = P(A) - P(A \cap B)$

$= 0.6 - 0.2 = 0.4$

(b) $n(x) = \frac{3x}{x(x-2)} - \frac{12}{(x-2)(x+2)}$

$\therefore$ The domain of $n = \mathbb{R} - \{0, 2, -2\}$

$n(x) = \frac{3}{x-2} - \frac{12}{(x-2)(x+2)}$

$= \frac{3x+6-12}{(x-2)(x+2)} = \frac{3x-6}{(x-2)(x+2)}$

$= \frac{3(x-2)}{(x-2)(x+2)} = \frac{3}{x+2}$

7) (a) $3x + 4y = 24$ (1)

$\therefore x - 2y = -2$ i.e. $2x - 4y = -4$ (2)

, Adding (1) and (2) : $\therefore 5x = 20 \therefore x = 4$

, Substituting in (1) : $\therefore y = 3$

$\therefore$ The S.S. = $\{(4, 3)\}$

(b) $\therefore 3x^2 - 6x + 1 = 0$

$\therefore a=3, b=-6$ and $c=1$

$\therefore x = \frac{6 \pm \sqrt{(-6)^2 - 4 \times 3 \times 1}}{2 \times 3} = \frac{6 \pm \sqrt{24}}{6}$

$\therefore x \approx 1.82$ or $x \approx 0.18$

$\therefore$ The S.S. = $\{1.82, 0.18\}$

9) (a) $\therefore x^2 - 2x - 4 = 0$

$\therefore a=1, b=-2$ and $c=-4$

$\therefore x = \frac{2 \pm \sqrt{(-2)^2 - 4 \times 1 \times -4}}{2 \times 1} = \frac{2 \pm \sqrt{20}}{2}$

$\therefore x \approx 3.2$ or $x \approx -1.2$

$\therefore$ The S.S. = $\{3.2, -1.2\}$

(b) $n(x) = \frac{x^2+x+1}{x} \times \frac{x(x-1)}{(x-1)(x^2+x+1)}$

$\therefore$ The domain of $n = \mathbb{R} - \{0, 1\}$

, $n(x) = 1$

8) (a) $n(x) = \frac{(x-2)(x-1)}{(x-7)(x+7)} \div \frac{x-2}{x+7}$

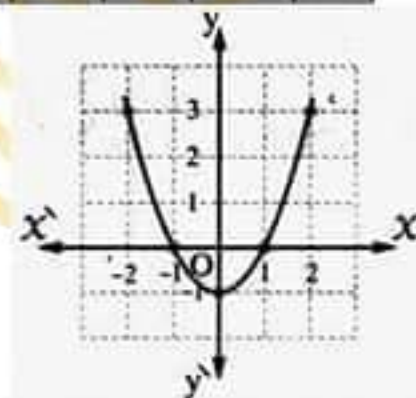
$\therefore$ The domain of $n = \mathbb{R} - \{7, -7, 2\}$

, $n(x) = \frac{(x-2)(x-1)}{(x-7)(x+7)} \times \frac{(x+7)}{(x-2)}$

, $n(x) = \frac{x-1}{x-7}$

(b) $f(x) = x^2 - 1$

x	-2	-1	0	1	2
y	3	0	-1	0	3



(1) The vertex point = $(0, -1)$

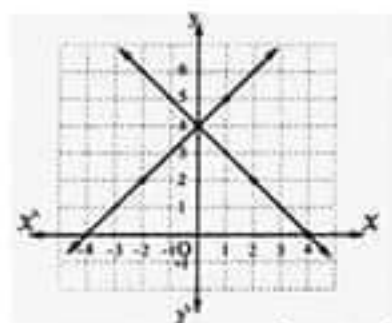
(2) The minimum value = -1

(3) The two roots of the equation :

$F(x) = 0$ are $-1, 1$

10)(a) Graphically:

$y = x + 4$				$y = 4 - x$			
X	0	1	-2	X	0	2	4
y	4	5	2	y	4	2	0



From the graph : The S.S. = $\{(0, 4)\}$

$$(b) n(x) = \frac{(x-2)(x+2)}{(x+2)(x+1)} \times \frac{x(x-2)}{(x-2)(x+1)}$$

$\therefore$ The domain of $n = \mathbb{R} - \{-2, -1, 2\}$

$$, n(x) = \frac{x-2}{x+1} - \frac{x}{x+1} = \frac{-2}{x+1}$$

$$, n(1) = \frac{-2}{2} = -1$$

11) (a) $\frac{1}{6}$

(b) $\therefore y = x + 2$ (1)

, Substituting in the other equation

$$\therefore x^2 + x(x+2) - 4 = 0$$

$$\therefore x^2 + x^2 + 2x - 4 = 0$$

$$\therefore 2x^2 + 2x - 4 = 0 \quad \therefore x^2 + x - 2 = 0$$

$$\therefore (x+2)(x-1) = 0$$

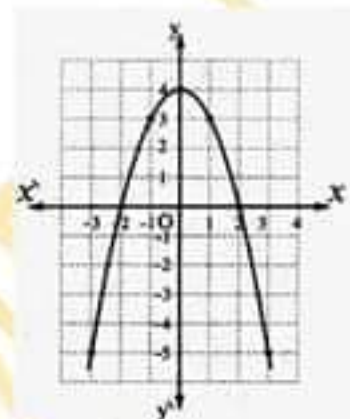
$$\therefore x = -2 \text{ and hence } y = 0$$

$$\text{or } x = 1 \text{ and hence } y = 3$$

$$\therefore \text{The S.S.} = \{(-2, 0), (1, 3)\}$$

12)(a) $f(x) = 4 - x^2$

X	-3	-2	-1	0	1	2	3
y	-5	0	3	4	3	0	-5



(1) Roots of the equation : $f(x) = 0$ are $-2, 2$

(2) The axis of symmetry is : $x = 0$

(b) $\therefore L - W = 4$ (1), $\therefore 2(L + W) = 28$

$$\therefore L + W = 14 \quad (2)$$

, Adding (1) and (2) : $\therefore 2L = 18$

$$\therefore L = 9, \text{ then } W = 5$$

$$\therefore \text{Area of the rectangle} = L \times W = 9 \times 5 = 45 \text{ cm}^2.$$

13)(a) $y = 3 + x$ (1), Substituting in the other equation

$$\therefore x^2 - 2x + 3(3 + x) = 15$$

$$\therefore x^2 - 2x + 9 + 3x = 15 \quad \therefore x^2 + x - 6 = 0$$

$$\therefore (x - 2)(x + 3) = 0$$

$$\therefore x = 2 \text{ and hence } y = 5$$

$$\text{or } x = -3 \text{ and hence } y = 0$$

$$\therefore \text{The S.S.} = \{(2, 5), (-3, 0)\}$$

$$(b) n(x) = \frac{(x-1)^2}{(x-1)(x^2+x+1)} \div \frac{x-1}{x^2+x+1}$$

$$\therefore \text{The domain of } n = \mathbb{R} - \{1\}$$

$$n(x) = \frac{(x-1)^2}{(x-1)(x^2+x+1)} \div \frac{x^2+x+1}{x-1}$$

$$\therefore n(x) = 1$$

15)(a) $2x - y = 3$ (1)

$$, x + 3y = 5 \quad \text{i.e. } 2x + 6y = 10$$

$$\text{Substituting (1) from (2)} : \therefore 7y = 7$$

$$\therefore y = 1 \text{ and hence } x = 2$$

$$\therefore \text{The S.S.} = \{(2, 1)\}$$

$$(b) n(x) = \frac{2(x+3)}{(x-2)(x+3)} + \frac{3x-4}{(x-2)(x-3)}$$

$$\therefore \text{The domain of } n = \mathbb{R} - \{2, -3, 3\}$$

$$\begin{aligned} n(x) &= \frac{2}{x-2} + \frac{3x-4}{(x-2)(x-3)} \\ &= \frac{2x-6+3x-4}{(x-2)(x-3)} = \frac{5x-10}{(x-2)(x-3)} \\ &= \frac{5(x-2)}{(x-2)(x-3)} = \frac{5}{x-3} \end{aligned}$$

14) (a) $\therefore 3x^2 - 5x + 1 = 0$

$$\therefore a = 3, b = -5 \text{ and } c = 1$$

$$\therefore x = \frac{5 \pm \sqrt{(-5)^2 - 4 \times 3 \times 1}}{2 \times 3} = \frac{5 \pm \sqrt{13}}{6}$$

$$\therefore x \approx 1.43 \text{ or } x \approx 0.23$$

$$\therefore \text{The S.S.} = \{1.43, 0.23\}$$

(b) Let the length be x cm. and the width be y cm.

$$\therefore x - y = 3 \quad (1)$$

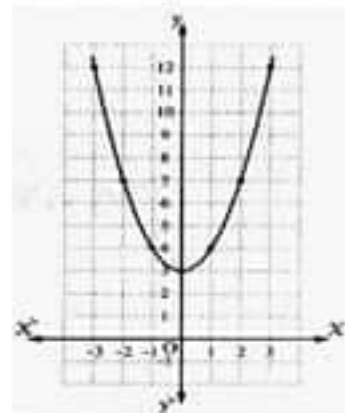
$$, 4y - 2x = 2 \quad \therefore 2y - x = 1 \quad (2)$$

$$\text{Adding (1) and (2)} : \therefore y = 4 \quad \therefore x = 7$$

$$\therefore \text{The length} = 7 \text{ cm. , the width} = 4 \text{ cm.}$$

16)(a) $f(x) = x^2 + 3$

X	-3	-2	-1	0	1	2	3
y	12	7	4	3	4	7	12



(1) The S.S. of the equation: $f(x) = 0$ is $\emptyset$

(2) The equation of the axis of symmetry is: $x = 0$

16) (b) $\therefore P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$$\therefore \frac{2}{3} = \frac{4}{9} + \frac{1}{3} - P(A \cap B)$$

$$\therefore P(A \cap B) = \frac{1}{9}$$

17) (a) $n(x) = \frac{(x-2)(x+2)}{(x+2)(x+1)} \div \frac{x(x-2)}{(x-2)(x+1)}$

$\therefore$ The domain of $n = \mathbb{R} - \{-2, -1, 0, 2\}$

$$n(x) = \frac{(x-2)(x+2)}{(x+2)(x+1)} \times \frac{(x-2)(x+1)}{x(x-2)} = \frac{x-2}{x}$$

(b) Let the measure of the two angle are

x and y where : $x > y$

$$\therefore x + y = 90^\circ \quad (1) \quad x - y = 40^\circ \quad (2)$$

, Adding (1) and (2) : $\therefore 2x = 130^\circ$

$$\therefore x = 65^\circ, y = 25^\circ$$

$\therefore$ The measure of the two angle are
65° and 25°

18)(a) $x = 7 - y$ (1), Substituting in the other equation

$$\therefore (7 - y)^2 + y^2 = 25 \quad \therefore 49 - 14y + y^2 + y^2 = 25$$

$$\therefore 2y^2 - 14y + 24 = 0$$

$$\therefore y^2 - 7y + 12 = 0 \quad \therefore (y - 3)(y - 4) = 0$$

$\therefore y = 3$ and hence $x = 4$ or $y = 4$ and

hence $x = 3$

$$\therefore \text{The S.S.} = \{(4, 3), (3, 4)\}$$

(b) $\therefore x(x+2) = 1 \quad \therefore x^2 + 2x - 1 = 0$

$$\therefore a = 1, b = 2 \text{ and } c = -1$$

$$\therefore x = \frac{-2 \pm \sqrt{(2)^2 - 4(1)(-1)}}{2 \times 1} = \frac{-2 \pm \sqrt{8}}{2}$$

$$\therefore x \approx 0.41 \text{ or } x \approx -2.41$$

$$\therefore \text{The S.S.} = \{0.41, -2.41\}$$

19) (a) $x - 2y = 0 \quad (1), 2x - y = 3$

$$\text{i.e. } -4x + 2y = -6$$

, Adding (1) and (2) : $\therefore -3x = -6$

$$\therefore x = 2, \text{ Substituting in (1) : } \therefore y = 1$$

$$\therefore \text{The S.S.} = \{(2, 1)\}$$

(b) $n(x) = \frac{3}{3(2x-1)(2x+1)} - \frac{2x}{2x(2x-1)}$

$$\therefore \text{The domain of } n = \mathbb{R} - \left\{\frac{1}{2}, -\frac{1}{2}, 0\right\}$$

$$n(x) = \frac{1}{(2x-1)(2x+1)} - \frac{1}{2x-1}$$

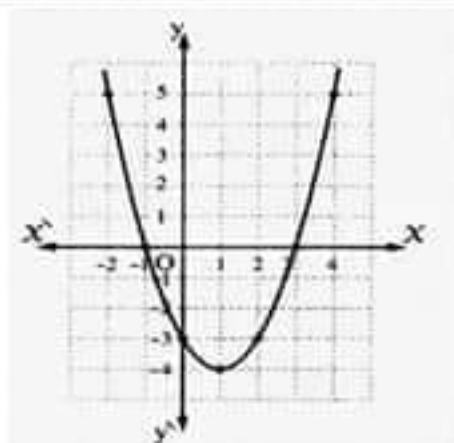
$$= \frac{1-2x-1}{(2x-1)(2x+1)} = \frac{-2x}{(2x-1)(2x+1)}$$

, $n(0)$ is undefined.

20)(a) (1) $\frac{3}{10}$ (2) $\frac{1}{10}$

(b) $f(x) = x^2 - 2x - 3$

x	-2	-1	0	1	2	3	4
y	5	0	-3	-4	-3	0	5



- (1) The vertex of the curve is (1, -4)
 (2) The minimum value of the function is -4
 (3) The two roots of the equation : $f(x) = 0$
 are -1, 3

21)(a) $x + y = 4$ (1), $2x - y = 2$ (2)

, Adding (1) and (2):

$\therefore 3x = 6$

$\therefore x = 2$, Substituting in (1)

$\therefore y = 2$ $\therefore$ The S.S. = $\{(2, 2)\}$

(b) Let the two integers x and y

$\therefore x + y = 9$ i.e. $x = 9 - y$ (1)

, $x^2 - y^2 = 27$ (2)

Substituting from (1) in (2) :

$\therefore (9 - y)^2 - y^2 = 27$

$\therefore 81 - 18y + y^2 - y^2 = 27$ $\therefore 18y = 54$

$\therefore y = 3$ and hence $x = 6$

$\therefore$ The two integers are : 6 and 3

22)(a) $n(x) = \frac{x-1}{(x-1)(x+1)} \div \frac{x(x-5)}{(x-5)(x+1)}$

$\therefore$ The domain of $n = \mathbb{R} - \{1, -1, 0, 5\}$

, $n(x) = \frac{1}{x+1} \times \frac{x+1}{x} = \frac{1}{x}$

(b) $x = 1 + y$ (1), Substituting in the other equation

$\therefore (1 + y)^2 + y^2 = 13$

$\therefore 1 + 2y + y^2 + y^2 = 13$ $\therefore 2y^2 + 2y - 12 = 0$

$\therefore y^2 + y - 6 = 0$ $\therefore (y + 3)(y - 2) = 0$

$\therefore y = -3$ and hence $x = -2$

or $y = 2$ and hence $x = 3$

$\therefore$ The S.S. = $\{(-2, -3), (3, 2)\}$

23)(a) $\because x^2 - 4x + 1 = 0$

$\therefore a = 1, b = -4$ and $c = 1$

$\therefore x = \frac{4 \pm \sqrt{(-4)^2 - 4 \times 1 \times 1}}{2 \times 1} = \frac{4 \pm \sqrt{12}}{2}$

$\therefore x \approx 3.73$ or $x \approx 0.27$

$\therefore$ The S.S. = $\{3.73, 0.27\}$

(b) $n(x) = \frac{x^2 - 2x + 4}{x^3 + 8} + \frac{x^2 - x - 2}{x^2 - 4}$
 $= \frac{x^2 - 2x + 4}{(x + 2)(x^2 - 2x + 4)} + \frac{(x - 2)(x + 1)}{(x - 2)(x + 2)}$

$\therefore$ The domain of $n = \mathbb{R} - \{-2, 2\}$

$\therefore n(x) = \frac{1}{x+2} + \frac{x+1}{x+2} = \frac{x+2}{x+2} = 1$

25) (a) $(x) = \frac{(x-1)(x+1)}{(x+2)(x+1)} \div \frac{x(x-1)}{x(x+2)}$

$\therefore$ The domain of $n = \mathbb{R} - \{-2, -1, 0, 1\}$

$\therefore n(x) = \frac{x-1}{x+2} \times \frac{x+2}{x-1} = 1$

(b) Graphically :

From the graph : The S.S. = $\{(2, 3)\}$

Algebraically :

$Y = x + 1$ (1) , Substituting in the other equation

$\therefore x + 1 = 2x - 1$

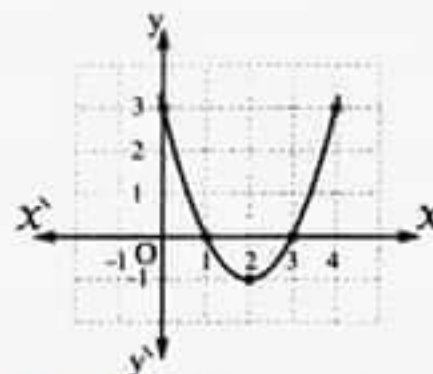
$\therefore x = 2$, Substituting in (1); $\therefore y = 3$

$\therefore$ The S.S. = $\{(2, 3)\}$

24)(a) (1) $\frac{2}{5}$ (2) $\frac{3}{5}$ (3) $\frac{13}{20}$

(b) $f(x) = x^2 - 4x + 3$

x	0	1	2	3	4
y	3	0	-1	0	3



From the graph:

(1) The minimum value = -1

(2) The S.S. of the equation:

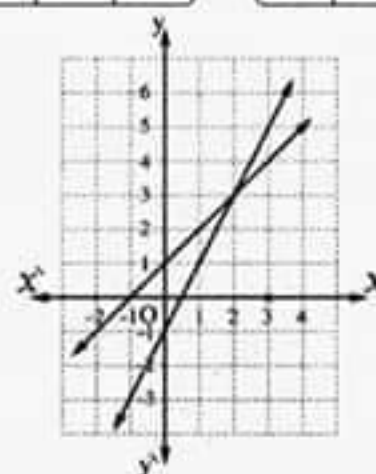
$x^2 - 4x + 3 = 0$ is $\{1, 3\}$

$y = x + 1$

x	-1	0	1
y	0	1	2

$y = 2x - 1$

x	0	2	3
y	-1	3	5



26)(a) $\because L - W = 2$ (1) , $2(L + W) = 3$

i.e. $L + W = 16$ (2)

, Adding (1) and (2) : $\therefore 2L = 18$

$\therefore L = 9, W = 7$

$\therefore$ Area of the rectangle $= 9 \times 7 = 63\text{cm}^2$.

(b)(1) $\because P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$\therefore 0.8 = 0.5 + X - 0.1 \quad \therefore X = 0.4$

(2) $\because A \subset B$, then $P(A \cup B) = P(B) = X$

$\therefore X = 0.8$

28)(a) $\because y = x + 2$, Substituting in the other equation

$\therefore x^2 + x(x + 2) - 4 = 0$

$\therefore x^2 + x^2 + 2x - 4 = 0$

$\therefore 2x^2 + 2x - 4 = 0$

$\therefore x^2 + x - 2 = 0 \quad \therefore (x - 1)(x + 2) = 0$

$\therefore x = 1$ and hence $y = 3$

or $x = -2$ and hence $y = 0$

$\therefore$ The S.S. $= \{ (1, 3), (-2, 0) \}$

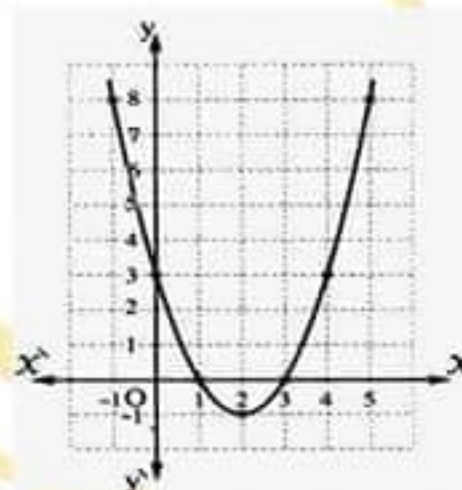
(b) $n(x) = \frac{3(x-5)}{(x-3)(x-5)} + \frac{(x-6)(x+3)}{(x-3)(x+3)}$

$\therefore$ The domain of $n = \mathbb{R} - \{ 3, 5, -3 \}$

, $n(x) = \frac{3}{x-3} \times \frac{x-6}{x-3} = \frac{x-3}{x-3} = 1$

27) (a) $f(x) = x^2 - 4x + 3$

X	-1	0	1	2	3	4	5
y	8	3	0	-1	0	3	8



From the graph:

(1) The minimum value of the function $= -1$

(2) The equation of the axis of symmetry is: $x = 2$

(3) The S.S. of the equation : $f(x) = 0$ is $\{ 1, 3 \}$

(b) $\because 3x^2 - 5x + 1 = 0$

$\therefore a = 3, b = -5$ and $c = 1$

$\therefore x = \frac{5 \pm \sqrt{(-5)^2 - 4 \times 3 \times 1}}{2 \times 3} = \frac{5 \pm \sqrt{13}}{6}$

$\therefore x \approx 1.43$ or $x \approx 0.23$

$\therefore$ The S.S. $= \{ 1.43, 0.23 \}$

$$29)(a) n(x) = \frac{x}{x(x+2)} + \frac{x-2}{(x-2)(x+2)}$$

∴ The domain of $n = \mathbb{R} - \{0, -2, 2\}$

$$, n(x) = \frac{1}{x+2} \times \frac{1}{x+2} = \frac{2}{x+2}$$

, $n(-2)$ is undefined

$$(b) 2(L + W) = 14 \quad \therefore L + W = 7$$

$$\therefore L = 7 - W$$

, $\because L^2 + W^2 = 25$, Substituting from (1)

$$\therefore (7 - w)^2 + w^2 = 25$$

$$\therefore 49 - 14w + w^2 + w^2 = 25$$

$$\therefore 2w^2 - 14w + 24 = 0$$

$$\therefore w^2 - 7w + 12 = 0 \quad \therefore (W - 3)(W - 4) = 0$$

$$\therefore W = 3 \text{ and hence } L = 4$$

or $W = 4$ and hence $L = 3$ (refused)

∴ The length = 4 cm. and the width = 3cm.

$$31)(a) \because 2x + y = 1 \quad (1), x + 2y = 5$$

$$\text{i.e. } -2x - 4y = -10 \quad (2)$$

, Adding (1) and (2) : $\therefore -3y = -9$

$$\therefore y = 3, \text{ from (1) : } \therefore x = -1$$

∴ The S.S. = $\{(-1, 3)\}$

$$(b) \because x^2 - x - 4 = 0$$

$$\therefore a = 1, b = -1 \text{ and } c = -4$$

$$\therefore x = \frac{1 \pm \sqrt{(-1)^2 - 4 \times 1 \times -4}}{2 \times 1} = \frac{1 \pm \sqrt{17}}{2}$$

$$\therefore x \approx \frac{1+4.12}{2} \text{ or } \approx \frac{1-4.12}{2}$$

$$\text{i.e. } x \approx 2.56 \text{ or } x \approx -1.56$$

$$30)(a) n(x) = \frac{(x-7)(x+7)}{(x-2)(x^2+2x+4)} \div \frac{x+7}{x-2}$$

∴ The domain of $n = \mathbb{R} - \{2, -7\}$

$$, n(x) = \frac{(x-7)(x+7)}{(x-2)(x^2+2x+4)} \times \frac{x-2}{x+7} \\ = \frac{x-7}{x^2+2x+4}$$

$$(b) \because x - y = 0$$

i.e. $x = y$, Substituting in the other equation

$$\therefore x^2 = 9$$

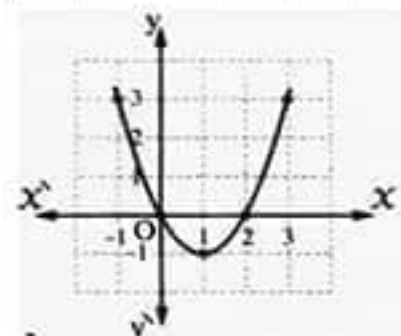
$$\therefore x = 3 \text{ and hence } y = 3$$

$$\text{or } x = -3 \text{ and hence } y = -3$$

∴ The S.S. = $\{(3, 3), (-3, -3)\}$

$$32)(a) f(x) = x^2 - 2x$$

x	-1	0	1	2	3
y	3	0	-1	0	3



From the graph:

The S.S. of the equation : $f(x) = 0$ is $\{0, 2\}$

$$(b) P(\bar{A}) = 1 - P(A) = 1 - \frac{3}{8} = \frac{5}{8}$$

$$, P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$\therefore \frac{5}{8} = \frac{3}{8} + \frac{1}{2} - P(A \cap B)$$

$$\therefore P(A \cap B) = \frac{1}{4}$$

$$33) (a) n(x) = \frac{x^2 - 2x + 4}{(x+2)(x^2 - 2x + 4)} + \frac{(x-2)(x+1)}{(x-2)(x+2)}$$

$\therefore$ The domain of $n = \mathbb{R} - \{-2, 2\}$

$$, n(x) = \frac{1}{x+2} + \frac{x+1}{x+2} = \frac{x+2}{x+2} = 1$$

$$(b) L - W = 4 \quad (1), 2(L+W) = 28$$

, Adding (1) and (2): $\therefore 2L = 18$

$$\therefore L = 9 \text{ and } W = 5$$

$\therefore$ Area of the rectangle = $L \times W = 45\text{cm}^2$.

$$35) (a) \because x^2 + x - 3 = 0 \quad \therefore a = 1, b = 1 \text{ and } c = -3$$

$$\therefore x = \frac{-1 \pm \sqrt{(-1)^2 - 4 \times 1 \times -3}}{2 \times 1} = \frac{-1 \pm \sqrt{13}}{2}$$

$$\therefore x \approx 1.3 \text{ or } x \approx 2.3$$

$$(b) n(x) = \frac{(x-2)(x^2 + 2x + 4)}{(x+3)(x-2)} \div \frac{x^2 + 2x + 4}{x-3}$$

$\therefore$ The domain of $n = \mathbb{R} - \{-3, 2, 3\}$

$$, n(x) = \frac{x+2x+4}{x+3} \times \frac{x-3}{x^2+2x+4} = \frac{x-3}{x+3}$$

$$34) (a) x - 2y = 4 \quad (1)$$

$$, 3x + y = 5 \quad \text{i.e. } 6x + 2y = 10 \quad (2)$$

, Adding (1) and (2): $\therefore 7x = 14 \quad \therefore x = 2 \quad \therefore y = -1$

$\therefore$ The S.S. = $\{(2, -1)\}$

(b) $\because x = y + 2$ (1), Substituting in the other equation

$$\therefore (y+2)^2 + (y+2)y = 0$$

$$\therefore y^2 + 4y + 4 + y^2 + 2y = 0$$

$$\therefore 2y^2 + 6y + 4 = 0 \quad \therefore y^2 + 3y + 2 = 0$$

$$\therefore (y+2)(y+1) = 0 \quad \therefore y = -2 \text{ and hence } x = 0$$

or $y = -1$ and hence $x = 1$

$\therefore$ The S.S. = $\{(0, -2), (1, -1)\}$

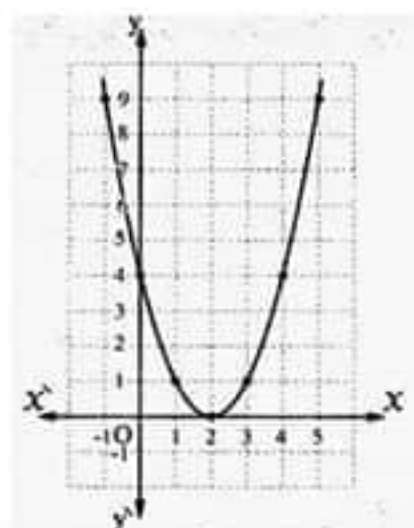
$$36) (a) f(x) = (x-2)^2$$

X	-1	0	1	2	3	4	5
y	9	4	1	0	1	4	9

(b) $\because$ A and B are two mutually exclusive

$$\therefore P(A \cup B) = P(A) + P(B)$$

$$\therefore 0.9 = 0.5 + x \quad \therefore x = 0.4$$



$$37)(a) n(x) = \frac{(x-1)(x+3)}{x+3} \div \frac{(x-1)(x+1)}{x+1}$$

$\therefore$ The domain of $n = \mathbb{R} - \{-3, 1, -1\}$

$$n(x) = (x-1) \times \frac{1}{(x-1)} = 1$$

(b) $y = 2 + x$ (1), Substituting in the other equation

$$x^2 + x(2+x) - 4 = 0$$

$$\therefore x^2 + 2x + x^2 - 4 = 0 \quad \therefore 2x^2 + 2x - 4 = 0$$

$$\therefore x^2 + x - 2 = 0 \quad \therefore (x+2)(x-1) = 0$$

$\therefore x = -2$ and hence $y = 0$ or $x = 1$ and hence $y = 3$

$\therefore$ The S.S. = $\{(-2, 0), (1, 3)\}$

$$39)(a) n(x) = \frac{x}{x(x+2)} + \frac{x-2}{(x+2)(x-2)}$$

$\therefore$ The domain of $n = \mathbb{R} - \{0, -2, 2\}$

$$n(x) = \frac{1}{x+2} \times \frac{1}{x+2} = \frac{2}{x+2}$$

(b) $x + y = 7$ (1), $5x - y = 5$ (2)

, Adding (1) and (2) : $\therefore 6x = 12$

$\therefore x = 2$, Substituting in (1) : $\therefore y = 5$

$\therefore$ The S.S. = $\{(2, 5)\}$

38)(a) Let the unit digit is x and the tens digit is y

$$\therefore x + y = 11 \quad (1) \quad 2x - 3y = 2 \quad (2)$$

Multiplying (1) by 2 : $\therefore 2x + 2y = 22$ (3)

, Substituting (2) from (3) : $\therefore 5y = 20$

$\therefore y = 4 \quad \therefore x = 7 \quad \therefore$ The number is 47

(b) $\therefore x^2 - 4x + 1 = 0 \quad \therefore a = 1, b = -4$ and $c = 1$

$$\therefore x = \frac{4 \pm \sqrt{(-4)^2 - 4 \times 1 \times 1}}{2 \times 1} = \frac{4 \pm \sqrt{12}}{2}$$

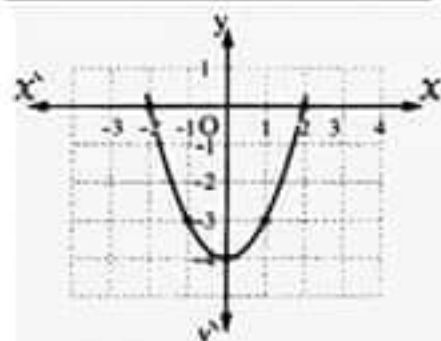
$\therefore x \approx 3.73$ or $x \approx 0.27$

$\therefore$ The S.S. = $\{3.73, 0.27\}$

$$40)(a) (1) \frac{1}{5} \quad (2) \frac{3}{10}$$

(b) $f(x) = x^2 - 4$

X	-2	-1	0	1	2
y	0	-3	-4	-3	0



From the graph

- The minimum value of the function is : - 4

- The set of zeroes of the function is :

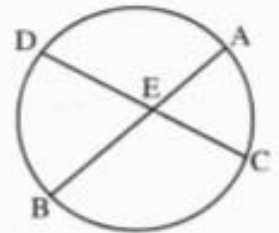
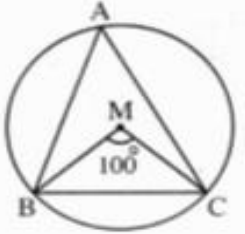
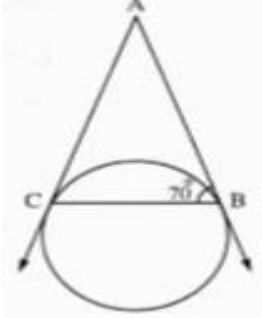
$\{(-2, 2)\}$

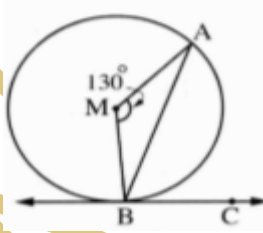
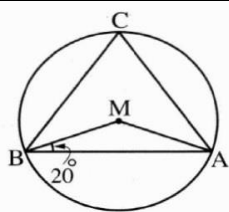
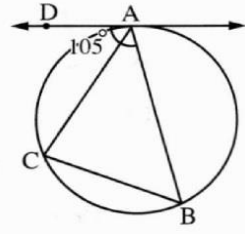
PREP 3

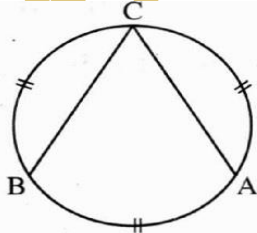
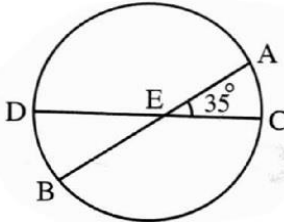
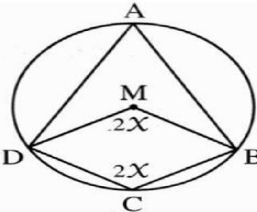
FINAL REVISION

SECOND GEOMETRY

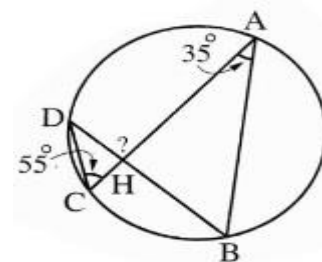
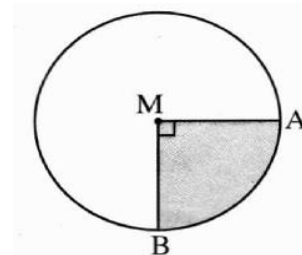
Choose the correct answer:

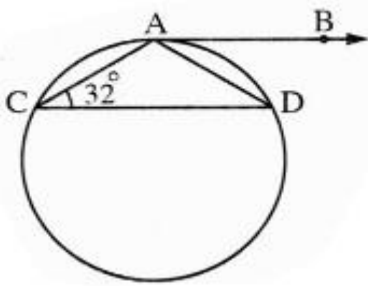
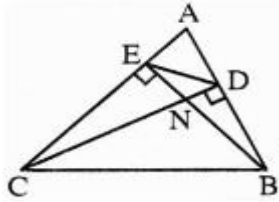
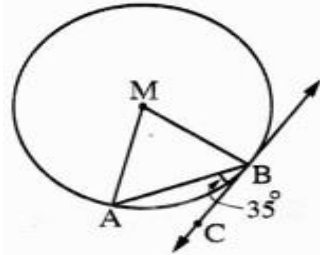
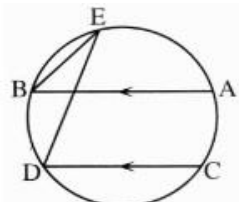
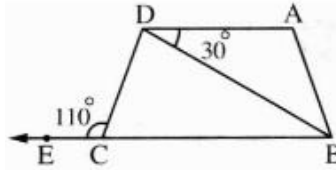
1)	In the opposite figure: $m \widehat{DB} = 80^\circ$, $m \widehat{AC} = 60^\circ$, then $m \angle AEC = \dots\dots\dots$ (20° or 30° or 70° or 140°)	
2)	The two tangents which are drawn from the two endpoints of a diameter of a circle are (parallel. or intersecting. or perpendicular. or coincide.)	
3)	In the opposite figure: M is a circle, $m \angle BMC = 100^\circ$, then $m \angle BAC = \dots\dots\dots$ (150° or 100° or 50° or 25°)	
4)	In the opposite figure: $\overrightarrow{AB}$ and $\overrightarrow{AC}$ are two tangents to the circle at B and C, $m \angle ABC = 70^\circ$, then $m \angle A = \dots\dots\dots$ (140° or 70° or 40° or 35°)	
5)	Sum of the measures of any two opposite angles in the cyclic quadrilateral equals (90° or 180° or 270° or 360°)	

6)	Measure of an arc which represents $\frac{1}{3}$ of the measure of the circle equals = (60° or 90° or 120° or 180°)	
7)	In the opposite figure: $\overrightarrow{BC}$ is a tangent to the circle M at B if $m(\angle AMB) = 130^\circ$, than $m(\angle ABC) = \dots\dots\dots$ (280° or 140° or 70° or 65°)	
8)	The length of the arc which represents $\frac{1}{4}$ of circumference of a circle = ($2\pi r$ or πr or $\frac{1}{2}\pi r$ or $\frac{1}{4}\pi r$)	
9)	In a cyclic quadrilateral, each two opposite angles are equal or supplementary intersecting or corresponding	
10)	If surface of circle M $\cap$ surface of circle N = $\emptyset$, than the two circles are intersecting or distant touching internally or touching externally	
11)	In the opposite figure: Circle M, if $m(\angle MBA) = 20^\circ$, then $m(\angle C) = \dots\dots\dots$ (120° or 70° or 40° or 30°)	
12)	In the opposite figure: If $\overleftrightarrow{AD}$ is a tangent to the circle at A , $m(\angle DAB) = 105^\circ$, then $m(\angle ACB) = \dots\dots\dots$ (75° or 60° or 50° or 35°)	

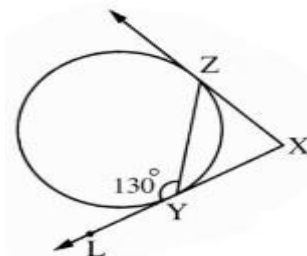
13)	The number of common tangents for the two tangent circles externally is	(4 or 3 or 2 or infinite number)
14)	The figure which the circle doesn't passing through its vertices is	(square or rectangle or rhombus or triangle)
15)	In the opposite figure: $m(\angle C) = \dots\dots\dots$	 (45° or 50° or 30° or 60°)
16)	In the opposite figure: $(\angle AEC) = 35^\circ$, then $m(\widehat{AC}) + m(\widehat{DB}) = \dots\dots\dots$	 (17.5° or 35° or 70° or 140°)
17)	The inscribed angle opposite to an arc greater than the semicircle is	(straight or acute or right or obtuse)
18)	In the opposite figure: If $m(\angle DMB) = m(\angle DCB) = 2x$, then $m(\angle A) = \dots\dots\dots$	 (60° or 70° or 40° or 30°)
19)	The diameter length of a circle is 8 cm. if the straight line L is at a distance 4 cm. form the Centre , then the straight line L is	a secant to the circle. or outside the circle. a tangent to the circle. or an axis of symmetry to the circle.

20)	The measure of the exterior angle at any vertex of a cyclic quadrilateral vertices..... the measure of the opposite interior of the adjacent angle. (> or < or = or ≥)
21)	The number of common tangents of two distant circles is (4 or 3 or 2 or infinite)
22)	The length of the arc opposite to the inscribed angle of measure $.60^\circ = \dots\dots\dots$ Circumference of the circle. ($\frac{1}{6}$ or $\frac{1}{3}$ or $\frac{1}{2}$ or otherwise)
23)	The inscribed angle drawn in a semicircle (acute or obtuse or reflex or right)
24)	In the opposite figure: $\overline{MA}$ and $\overline{MB}$ two radii in a circle M, $\overline{MA} \perp \overline{MB}$ and the radius length is 7 cm. then the perimeter of the shaded part =.....cm. (14 or 21 or 38.5 or 25)
25)	The measure of the circle with radius r is ($2\pi r$ or 180° or πr or 360°)
26)	In the opposite figure: $m(\angle C) = 55^\circ$, $m(\angle A) = 35^\circ$, then $m(\angle AHD) = \dots\dots\dots$ (20° or 90° or 70° or 110°)
27)	The Centre of inscribed circle of a triangle is the intersection point of is altitudes. or axes of symmetry of its sides. medians. or bisectors of its interior angles.



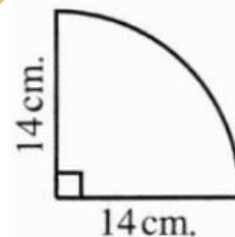
28)	In the opposite figure: $\overrightarrow{AB}$ is tangent to the circle, $m(\angle C) = 32^\circ$, then $m(\angle BAD) = \dots\dots\dots$ (64° or 32° or 148° or 58°)	
29)	If M and N are two touching externally circles with radii lengths 9 cm. and r cm. respectively , if $MN = 14$ cm. , then $r = \dots\dots\dots$ cm. (10 or 23 or 5 or 7)	
30)	In the opposite figure: How many cyclic quadrilaterals? (1 or 2 or 3 or 4)	
31)	In the opposite figure: $\overrightarrow{BC}$ is a tangent to the circle M , $m(\angle ABC) = 35^\circ$, then $m(\angle AMB) = \dots\dots\dots$ (105° or 120° or 70° or 60°)	
32)	In the opposite figure: $\overline{AB}$ and $\overline{CD}$ are two parallel chords of a circle , $m(\angle DEB) = 25^\circ$, then $m(\widehat{AC}) = \dots\dots\dots$ (100° or 75° or 50° or 25°)	
33)	In the opposite figure: ABCD is a cyclic quadrilateral , $m(\angle ADB) = 30^\circ$ and $m(\angle DCE) = 110^\circ$, then $m(\angle ABD) = \dots\dots\dots$ (30° or 40° or 60° or 70°)	

- 34) In the opposite figure:
 $\overrightarrow{XZ}$, $\overrightarrow{XL}$ are two tangents to the circle
 at Y and Z,
 $m(\angle LYZ) = 130^\circ$, then $m(\angle X) = \dots\dots\dots$
 (50° or 65° or 80° or 100°)

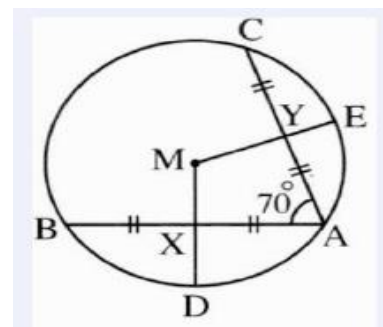


- 35) If the measures of the two arcs are equal in the same circle then
 their chords are
 intersecting. or parallel
 perpendicular. or equal in length.

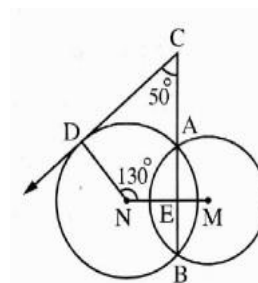
- 36) In the opposite figure:
 A metallic wire is formed in the form of a quarter of
 a circle of radius length 14 cm. as shown, then the
 length of the wire =
 where $\pi = \frac{22}{7}$
 (154 cm. or 50 cm. or 26 cm. or 22cm.)

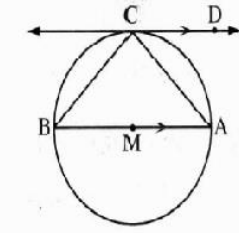
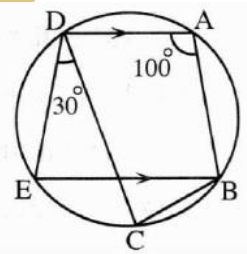
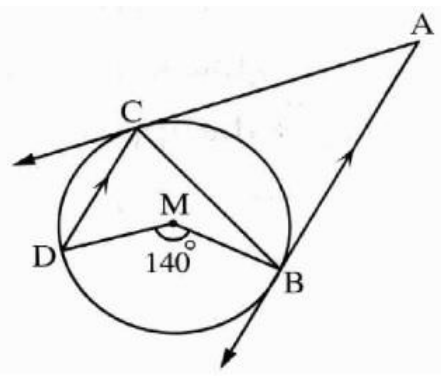
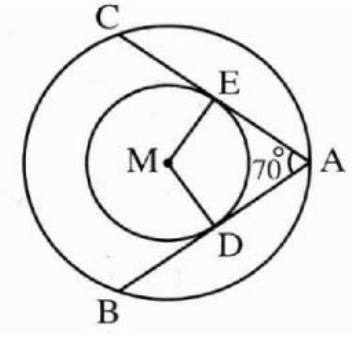


- 1) a) In the opposite figure:
 $\overline{AB}$ and $\overline{AC}$ are two equal chords in length
 In the circle M, X is the midpoint of
 $\overline{AB}$ and Y
 Is the midpoint of $\overline{AC}$, $m(\angle CAB) = 70^\circ$
 (1) Calculate: $m(\angle DME)$
 (2) Prove that: $XD = YE$

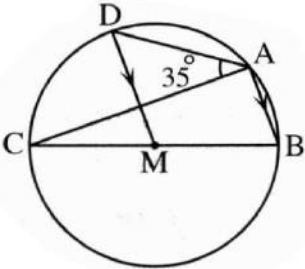
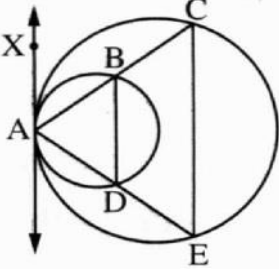
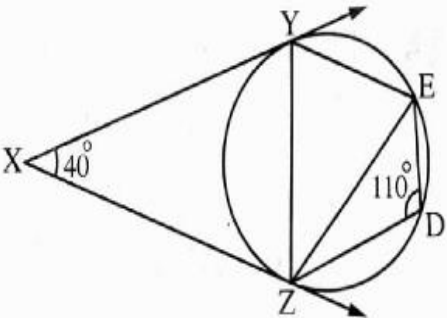
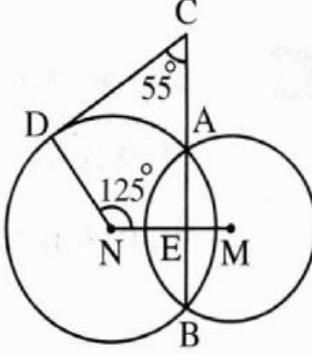


- b) In the opposite figure:
 M and N are two circles intersecting at A and B.
 and $C \in \overrightarrow{BA}$,
 $D \in$ the circle N, $m(\angle MND) = 130^\circ$,
 $m(\angle BCD) = 50^\circ$,
 Prove that: $\overrightarrow{CD}$ is a tangent to the circle at D



2)	a) In the opposite figure: $\overline{CD}$ is a tangent to the circle M at C, $\overline{CD} \parallel \overline{BA}$ Prove that : $m(\angle DCA) = 45^\circ$ 
3)	a) In the opposite figure: $\overline{AD} \parallel \overline{BE}$, $m(\angle BAD) = 100^\circ$ And $m(\angle CDE) = 30^\circ$ Find: $m(\angle ADC)$ 
4)	a) In the opposite figure: $\overline{AB}$ and $\overline{AC}$ are two tangents to the circle M at B and C $\overline{AB} \parallel \overline{CD}$, $m(\angle BMD) = 140^\circ$ Find: $m(\angle A)$ 
	a) In the opposite figure: Two concentric circles at M , $\overline{AB}$ and $\overline{AC}$ are two tangent segments to the smaller circles, $m(\angle A) = 70^\circ$ (1) Find: $m(\angle DME)$ (2) Prove that : $AB = AC$ 

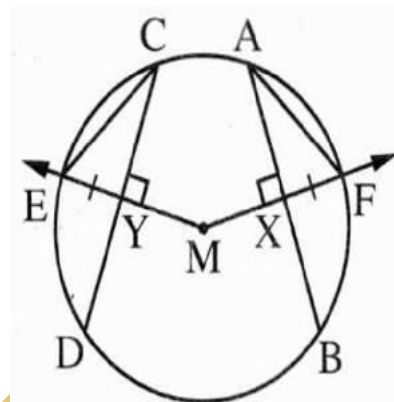
	b) In the opposite figure: $\overrightarrow{BC}$ is a tangent to the circle M at C D is the midpoint of $\overline{EC}$, $\overline{MC} \parallel \overline{AB}$ Prove that : ABCD is a cyclic quadrilateral.	
5)	a) In the opposite figure: A circle of Centre M, $\overline{MD} \perp \overline{AB}$, If $m(\angle A) = 30^\circ$ (1) Prove that : $\overline{MD} \parallel \overline{CB}$ (2) Find : $m(\angle C)$	
	b) In the opposite figure: A circle M, $\overline{MD} \perp \overline{AB}$, $\overline{ME} \perp \overline{AC}$ where $MD = ME$, $m(\angle DME) = 120^\circ$ Prove that : the triangle ABC is equilateral.	
6)	a) In the opposite figure: If: $AB = AD$, $m(\angle ABD) = 30^\circ$, $m(\angle C) = 60^\circ$ Prove that : ABCD is a cyclic quadrilateral	
	b) In the opposite figure: ABCD is a cyclic quadrilateral, $\overline{BD}$ bisects $\angle ABC$, If $\overline{BD} \cap \overline{AC} = \{E\}$ Prove that : $\overrightarrow{CD}$ is a tangent to the circle Passing through the vertices of $\triangle BEC$	

7)	a) In the opposite figure: $\overline{BC}$ is a diameter in the circle M, $m(\angle CAD) = 35^\circ$, $\overline{AB} \parallel \overline{DM}$, Find: $m(\angle ABC)$ 
8)	a) In the opposite figure: If $\overleftrightarrow{AX}$ is a common tangent to the two circles at A. Prove that: $\overline{BD} \parallel \overline{CE}$  b) In the opposite figure: $\overrightarrow{XY}$ and $\overrightarrow{XZ}$ are two tangents to the circle from the point X at Y, Z, if $m(\angle EDZ) = 110^\circ$, $m(\angle YXZ) = 40^\circ$ Prove that: $m(\widehat{ZDE}) = m(\widehat{ZY})$ 
9)	a) In the opposite figure: M and N are two intersecting circles at A and B $C \in \overline{BA}$, $D \in$ the circle N $m(\angle MND) = 125^\circ$ and $m(\angle BCD) = 55^\circ$ Prove that: $\overline{CD}$ is a tangent to circle N at D 

b) In the opposite figure:

$\overline{AB}$ and $\overline{CD}$ are two chords in the circle M
 $\overrightarrow{MX} \perp \overline{AB}$ and intersects the circle in F
 $\overrightarrow{MY} \perp \overline{CD}$ and intersects the circle at E
 where $FX = EY$

Prove that: (1) $AB = CD$
 (2) $AF = CE$

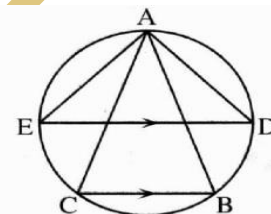


10)

a) In the opposite figure:

ABC is an inscribed triangle inside a circle
 $\overline{DE} \parallel \overline{BC}$

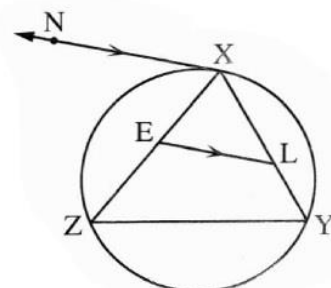
Prove that: $m(\angle DAC) = m(\angle BAE)$



b) In the opposite figure:

XYZ is an inscribed triangle in a circle
 $\overline{LE}$ parallel tangent $\overrightarrow{XN}$

Prove that :
 LYZE is cyclic quadrilateral.



11)

a) In the opposite figure:

$\overline{AB}$, $\overline{AC}$ are two tangents

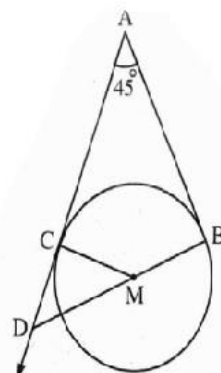
To circle M at B, C,

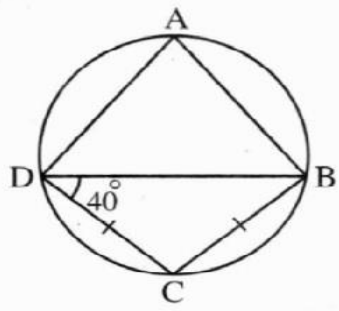
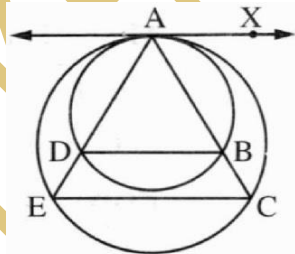
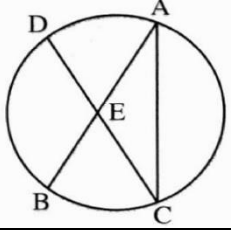
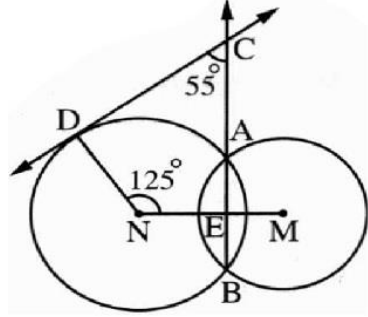
$m(\angle A) = 45^\circ$

Prove that:

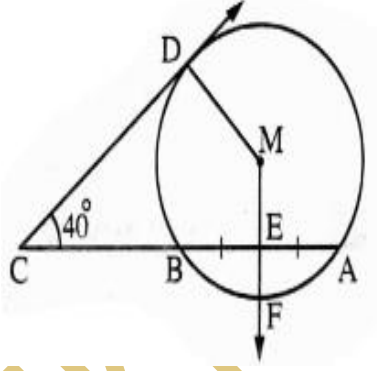
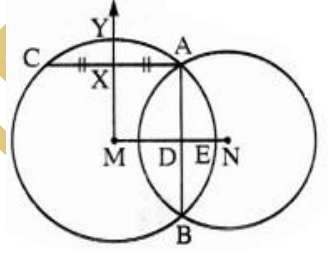
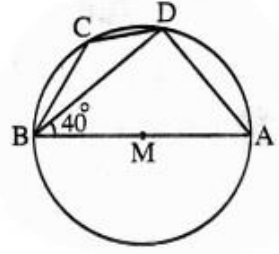
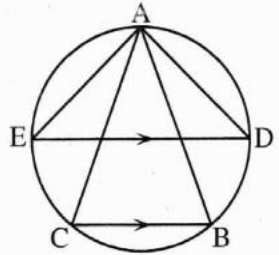
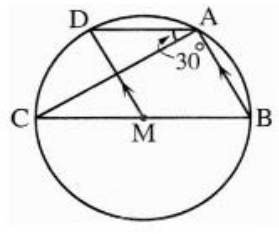
(1) ABMC is cyclic quadrilateral.

(2) $AD = AB + MB$



	b) In the opposite figure: $ABCD$ is a quadrilateral inscribed in circle, $BC = CD$, $m(\angle BDC) = 40^\circ$ Find: $m(\angle A)$	
12)	a) In the opposite figure: Prove that: $\overline{BD} \parallel \overline{CE}$ b) In the opposite figure: $\overline{AB}$, $\overline{CD}$ are two equal chords in length Prove that : the triangle ACE is an isosceles triangle.	 
13)	a) In the opposite figure: M and N are two intersecting circles at A and B, $C \in \overrightarrow{BA}$ and $D \in$ the circle N, $m(\angle MND) = 125^\circ$, $m(\angle BCD) = 55^\circ$ Prove that: $\overline{CD}$ is a tangent to the circle N at D b) $\overline{AB}$ and $\overline{CD}$ are two chords in the circle M, $\overline{MX}$ is drawn perpendicular to $\overline{AB}$ to intersect the circle in F and $\overline{MY}$ is drawn perpendicular to $\overline{CD}$ to intersect the circle at E, if $FX = EY$ Prove that : (1) $AB = CD$ (2) $AF = CE$	

14)	a) In the opposite figure: E is a point outside the circle Prove that : $m(\angle DCB) > m(\angle E)$	
14)	b) In the opposite figure: $m(\angle ABE) = 100^\circ$ $m(\angle CAD) = 40^\circ$ Prove that: $m(\widehat{CD}) = m(\widehat{AD})$	
15)	Complete: a) The straight line passing through the center of the circle and the intersection point of the two tangents are to the chord of tangency of those two tangents. b) In the opposite figure: ABC is an inscribed triangle inside the circle $\overline{DE} \parallel \overline{BC}$ Prove that : $m(\angle DAC) = m(\angle BAE)$	
16)	In the opposite figure: XYZ is an inscribed triangle in a circle , if $L \in \overline{XY}$ and $\overline{LE}$ is drawn parallel to the tangent $\overline{XN}$ which touches the circle at X and intersects $\overline{XZ}$ at E Prove that : LYZE is a cyclic quadrilateral.	

17)	a) In the opposite figure: A circle M whose radius length is 10 cm., $m(\angle DCA) = 40^\circ$, $AB = 16$ cm. E is the midpoint of $\overline{AB}$, $\overline{CD}$ is a tangent to the circle Find by proof: $m(\angle DMF)$, the length of $\overline{FE}$	
	b) In the opposite figure: If M and N are two intersecting circles at A and B, $AB = AC$, X is the midpoint of $\overline{AC}$ Prove that: $XY = DE$	
18)	a) In the opposite figure: $\overline{AB}$ is a diameter of circle M, $m(\angle ABD) = 40^\circ$ Find $m(\angle A)$, $m(\angle C)$	
19)	b) In the opposite figure: ABC is an inscribed triangle in the circle, $\overline{ED} \parallel \overline{BC}$ Prove that: $m(\angle DAC) = m(\angle BAE)$	
20)	a) In the opposite figure: $\overline{CB}$ is a diameter of circle M, $\overline{AB} \parallel \overline{DM}$, $m(\angle DAC) = 30^\circ$ Find: $m(\angle ACB)$	

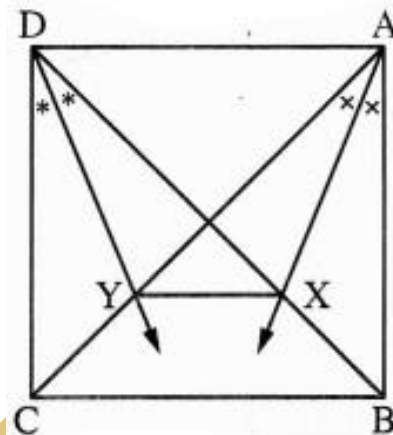
b) In the opposite figure:

ABCD is a square, $\overrightarrow{AX}$ bisects $\angle BAC$

and $\overrightarrow{DY}$ bisects $\angle CDB$

(1) Prove that the figure AXYD is cyclic quadrilateral

(2) Find with proof $m(\angle DXY)$



21) In the opposite figure:

$\overrightarrow{XZ}$ and $\overrightarrow{XY}$ are two tangents at Z and Y,

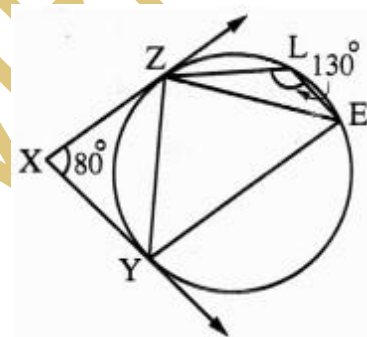
$m(\angle YXZ) = 80^\circ$, $m(\angle ELZ) = 130^\circ$

Prove that:

(1) $ZE = ZY$

(2) $\overrightarrow{XZ} \parallel \overrightarrow{YE}$

(3) $\overrightarrow{ZE}$ is a tangent to the circle passing through the points X, Y and Z



22) a) $\overline{AB}$ is a diameter in the circle M, $\overline{AC}$ is a chord in it where $m(\angle BAC) = 30^\circ$, $\overline{BC}$ is drawn and $\overline{MD}$ is drawn perpendicular to $\overline{AC}$ and intersect it in D,

Prove that

(1) $\overline{MD} \parallel \overline{BC}$

(2) The length of $\overline{BC}$ = length of radius.

b) In the opposite figure:

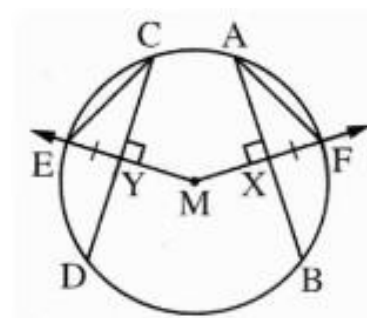
$\overline{AB}$ and $\overline{CD}$ are two chords in the circle M,

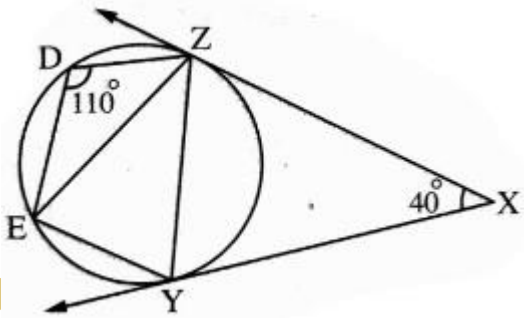
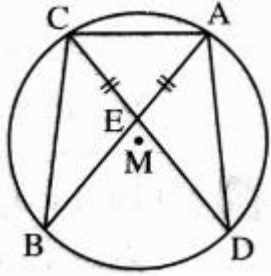
$\overrightarrow{MX} \perp \overline{AB}$ and intersect it at F

, $\overrightarrow{MY} \perp \overline{CD}$ and intersect it at E

, $FX = EY$

Prove that: (1) $AB = CD$ (2) $AF = CE$



23)	a) Prove that: In a cyclic quadrilateral each two opposite angles are supplementary.
	b) In the opposite figure: $\overrightarrow{XY}, \overrightarrow{XZ}$ are two tangents to the circle from point X , $m(\angle D) = 110^\circ$, $m(\angle X) = 40^\circ$ Prove that $m(\widehat{ZE}) = m(\widehat{ZY})$ 
24)	a) A is a point outside a circle M , $\overrightarrow{AB}$ is a tangent to the circle at point B , $\overrightarrow{AM}$ intersects the circle M at C and D respectively , $m(\angle A) = 40^\circ$ and draw $\overline{BM}$ Find with proof: $m(\angle BDC)$
	b) In the opposite figure $\overline{AB}, \overline{CD}$ are two chords in the circle M intersecting at E , If $AE = CE$ Prove that: $m(\angle ACB) = m(\angle CAD)$ 
25)	$\overline{AB}$ is a diameter in the circle M , $\overline{AC}$ is a chord in this circle and D is the midpoint of $\overline{AC}$, $\overrightarrow{DM}$ was drawn to intersect the tangent to the circle M at B in E Prove that: (1) The figure ADBE is cyclic quadrilateral. (2) $m(\angle CMB) = 2 m(\angle MEB)$

The answer

1)	70°	2)	parallel
3)	50°	4)	40°
5)	180°	6)	120°
7)	65°	8)	$\frac{1}{2} \pi r$
9)	supplementary	10)	distant
11)	70°	12)	75°
13)	3	14)	rhombus
15)	60°	16)	70°
17)	obtuse	18)	60°
19)	a tangent to the circle	20)	=
21)	4	22)	$\frac{1}{3}$
23)	right	24)	25
25)	360°	26)	90°
27)	bisectors of its interior angles	28)	32°
29)	5	30)	2
31)	70°	32)	50°
33)	40°	34)	80°
35)	equal in length	36)	50 cm

1)(a) $\because X$ is midpoint of $\overline{AB} \therefore \overline{MX} \perp \overline{AB}$

$\because Y$ is midpoint of $\overline{AC} \therefore \overline{MY} \perp \overline{AC}$

$\because$ The sum of measure of the interior

angle of the quadrilateral $AXMY = 360^\circ$

$$\therefore m(\angle XMY) = 360^\circ - (70^\circ + 90^\circ + 90^\circ) = 110^\circ$$

$$\therefore m(\angle DME) = 110^\circ \quad (\text{Q.E.D. 1})$$

$$\therefore AB = AC \quad \therefore MX = MY$$

$$\therefore MD = ME \text{ (lengths of two radii)}$$

By subtracting

$$\therefore XD = YE \quad (\text{Q.E.D. 2})$$

(b) $\because \overline{MN}$ is the line of centres, $\overline{AB}$ is the common chord

$$\therefore \overline{AB} \perp \overline{MN} \quad \therefore m(\angle AEN) = 90^\circ$$

$\because$ The sum of measure of the interior angle

of the quadrilateral $CDNE = 360^\circ$

$$\therefore m(\angle CDN) = 360^\circ - (50^\circ + 130^\circ + 90^\circ) = 90^\circ$$

$$\therefore \overline{ND} \perp \overline{CD}$$

$\therefore \overline{CD}$ is a tangent to the circle N at D . (Q.E.D.)

2)(a) $\because \overline{DC} \parallel \overline{AB}$

$$\therefore m(\widehat{AC}) = m(\widehat{BC})$$

$\therefore \overline{AB}$ is a diameter in circle M

$$\therefore m(\widehat{ACB}) = 180^\circ$$

$$\therefore m(\widehat{AC}) = 180^\circ \div 2 = 90^\circ$$

$$\therefore m(\angle DCA) = \frac{1}{2} m(\widehat{AC})$$

$$\therefore m(\angle DCA) = \frac{1}{2} \times 90^\circ = 45^\circ \quad (\text{The req.})$$

3)(a) $\because m(\angle EDC) = m(\angle EBC)$

(two inscribed angle subtended by $\widehat{EC}$)

$$\therefore m(\angle EBC) = 30^\circ$$

$\because \overline{AD} \parallel \overline{BE}$, $\overline{AB}$ is a transversal

$$\therefore m(\angle A) + m(\angle ABE) = 180^\circ$$

(two interior angle on the same side of the transversal)

$$\therefore m(\angle ABE) = 180^\circ - 100^\circ = 80^\circ$$

$$\therefore m(\angle ABC) = 80^\circ + 30^\circ = 110^\circ$$

$\because ABCD$ is a cyclic quadrilateral

$$\therefore m(\angle ABC) + m(\angle ADC) = 180^\circ$$

$$\therefore m(\angle ADC) = 180^\circ - 110^\circ = 70^\circ \text{ (the req.)}$$

(b) $\because m(\angle BCD) = \frac{1}{2} m(\widehat{BMD})$

(inscribed and central angle subtended by $\widehat{AD}$)

$$\therefore m(\angle BCD) = \frac{1}{2} \times 140^\circ = 70^\circ$$

$\because \overline{AB} \parallel \overline{CD}$, $\overline{BC}$ is a transversal

$$\therefore m(\angle ABC) = m(\angle BCD) = 70^\circ \text{ (alternate angle)}$$

$\therefore AB = AC$

$$\therefore m(\angle ABC) = m(\angle ACB) = 70^\circ$$

$\therefore$ in $\triangle ABC$:

$$m(\angle A) = 180^\circ - (2 \times 70^\circ) = 40^\circ \text{ (the req.)}$$

(b) $\because \overline{DE} \parallel \overline{BC} \quad \therefore m(\widehat{DB}) = m(\widehat{EC})$

$$\therefore m(\angle BAD) = m(\angle EAC)$$

adding $m(\angle BAC)$ to both sides

$$\therefore m(\angle DAC) = m(\angle BAE) \quad (\text{Q.E.D.})$$

4)(a) $\because \overline{AB}$ and $\overline{AC}$ are two tangents to the smaller circle

$$\therefore \overline{MD} \perp \overline{AB}, \overline{ME} \perp \overline{AC}$$

$$\therefore m(\angle MDA) = m(\angle MEA) = 90^\circ$$

$\therefore$ From the quadrilateral ADME :

$$m(\angle DME) = 360^\circ - (90^\circ + 70^\circ + 90^\circ) = 110^\circ$$

(First req.)

$\because MD = ME$ (two radii in the smaller circle)

$$\therefore AB = AC \quad \text{(second req.)}$$

(b) $\because D$ is the midpoint of the chord $\overline{EC}$

$$\therefore \overline{MD} \perp \overline{EC} \quad \therefore m(\angle MDC) = 90^\circ$$

$\because \overline{BC}$ is a tangent to the circle at C

$$\therefore \overline{MC} \perp \overline{BC} \quad \therefore m(\angle MCB) = 90^\circ$$

$\because \overline{AB} \parallel \overline{MC}$, $\overline{BC}$ is a transversal to them

$$\therefore m(\angle MCB) + m(\angle ABC) = 180^\circ$$

(two interior angle in the same side of the transversal)

$$\therefore m(\angle ABC) = 180^\circ - 90^\circ = 90^\circ$$

$$\therefore m(\angle ADC) + m(\angle ABC) = 90^\circ + 90^\circ = 180^\circ$$

$\therefore$ The figure ABCD is a cyclic quadrilateral.

(Q.E.D.)

6)(a) In $\triangle ABC$: $\because AB = AC$

$$\therefore m(\angle ABD) = m(\angle ADB) = 30^\circ$$

$$\therefore m(\angle A) = 180^\circ - 2 \times 30^\circ = 120^\circ$$

$$\therefore m(\angle A) + m(\angle C) = 120^\circ + 60^\circ = 180^\circ$$

$\therefore$ ABCD is a cyclic quadrilateral. (Q.E.D.)

5)(a) $\overline{MD} \perp \overline{AB} \quad \therefore m(\angle ADM) = 90^\circ$

$\because \overline{AC}$ is a diameter in the circle M

$$\therefore m(\angle ABC) = 90^\circ$$

$$\therefore m(\angle ADM) = m(\angle ABC) = 90^\circ$$

and they are corresponding angles.

$$\therefore \overline{MD} \parallel \overline{BC} \quad \text{(First req.)}$$

$$\text{In } \triangle ABC : \because m(\angle A) = 30^\circ, m(\angle ABC) = 90^\circ$$

$$\therefore m(\angle C) = 180^\circ - (30^\circ + 90^\circ) = 60^\circ \quad \text{(second req.)}$$

(b) $\because \overline{MD} \perp \overline{AB} \quad \therefore D$ is the midpoint of $\overline{AB}$

$\because \overline{ME} \perp \overline{AC} \quad \therefore E$ is the midpoint of $\overline{AC}$

$$\therefore MD = ME \quad \therefore AB = AC \quad (1)$$

From the quadrilateral ADME

$$m(\angle A) = 360^\circ - (120^\circ + 90^\circ + 90^\circ) = 60^\circ \quad (2)$$

From (1) and (2) :

$\therefore \triangle ABC$ is an equilateral triangle. (Q.E.D.)

(b) $\because$ ABCD is a cyclic quadrilateral.

$$\therefore m(\angle DCA) = m(\angle DBA) \quad (1)$$

(drawn on $\overline{AD}$ and on the same side of it

$\because \overline{BD}$ bisects $\angle ABC$

$$\therefore m(\angle DBC) + m(\angle DBA) \quad (2)$$

From (1), (2) : $\therefore m(\angle DBC) + m(\angle DCA)$

$\therefore \overline{CD}$ is a tangent to the circle passing through the vertices of $\triangle BEC$ (Q.E.D.)

7)(a) $\therefore m(\angle CMD) = 2m(\angle CAD)$

(central and inscribed angles subtended by $\widehat{CD}$)

$\therefore m(\angle CMD) = 2 \times 35^\circ = 70^\circ$

$\therefore \overline{AB} \parallel \overline{DM}$, $\overline{BM}$ is a transversal

$\therefore m(\angle ABC) = m(\angle CMD)$ (corresponding angles)

$\therefore m(\angle ABC) = 70^\circ$ (The red.)

(b) $\therefore m(\angle ABC) = \frac{1}{2} [m(\widehat{AC}) - m(\widehat{DE})]$

$\therefore m(\angle ABC) = \frac{1}{2} [120^\circ - 50^\circ]$
 $= \frac{1}{2} \times 70^\circ = 35^\circ$

9)(a) $\therefore \overline{MN}$ is the line of centers, $\overline{AB}$ is the common chord

$\therefore \overline{AB} \perp \overline{MN} \quad \therefore m(\angle AEN) = 90^\circ$

$\therefore$ The sum of the measures of the interior angles of the quadrilateral CDNE = 360°

$\therefore m(\angle CDN) = 360^\circ - (55^\circ + 125^\circ + 90^\circ) = 90^\circ$

$\therefore \overline{ND} \perp \overline{CD}$

$\therefore \overline{CD}$ is a tangent to the circle N at D (Q.E.D.)

[b] $\therefore MF = ME$ (lengths of two radii)

$\therefore XF = YE \quad \therefore MX = MY$

$\therefore \overline{MX} \perp \overline{AB}, \overline{MY} \perp \overline{CD}$

$\therefore AB = CD$ (Q.E.D.1)

$\therefore \overline{MX} \perp \overline{AB}$

$\therefore X$ is the midpoint of $\overline{AB} \quad \therefore AX = \frac{1}{2} AB$

$\therefore \overline{MY} \perp \overline{CD}$

$\therefore Y$ is the midpoint of $\overline{CD} \quad \therefore CY = \frac{1}{2} CD$

$\therefore AB = CD \quad \therefore AX = CY$

$\therefore \triangle AXF, \triangle CYE$

8)(a) In the small circle

$\therefore m(\angle XAB)$ (the tangency angle)

$= m(\angle ADB)$ (the inscribed angle) (1)

In the great circle

$\therefore m(\angle XAC)$ (the tangency angle)

$= m(\angle AEC)$ (the inscribed angle) (2)

From (1) and (2) :

$\therefore m(\angle ADB) = m(\angle AEC)$ but they are corresponding

$\therefore \overline{DB} \parallel \overline{EC}$ (Q.E.D.)

(b) $\therefore \overline{xy}$ and $\overline{xz}$ are two tangents

$\therefore XY = XZ$

$\therefore$ In $\triangle XYZ : m(\angle XZY) = m(\angle XYZ)$

$= \frac{180^\circ - 40^\circ}{2} = 70^\circ$

$\therefore m(\angle XZY)$ (tangency) = $m(\angle YEZ)$ (inscribed)

$\therefore m(\angle YEZ) = 70^\circ$

$\therefore DEYZ$ is a cyclic quadrilateral

$\therefore m(\angle EYZ) + m(\angle D) = 180^\circ$

$\therefore m(\angle EYZ) = 180^\circ - 110^\circ = 70^\circ$

$\therefore m(\angle EYZ) = m(\angle YEZ) = 70^\circ$

$\therefore$ In $\triangle EYZ : ZE = ZY$

$\therefore m(\widehat{ZDE}) = m(\widehat{ZY})$

In them $\begin{cases} AX = CY \\ XF = YE \\ m(\angle AXF) = m(\angle CYE) = 90^\circ \end{cases}$

$\therefore \triangle AXF \equiv \triangle CYE$ then we deduce that $AF = CE$

(Q. E. D. 2)

10) $\because \overline{DE} \parallel \overline{BC} \quad \therefore m(\widehat{BD}) = m(\widehat{CE})$

$\therefore m(\angle DAB) = m(\angle CAE)$

adding $m(\angle BAC)$ to both sides

$\therefore (\angle DAC) = m(\angle BAE) \quad (\text{Q.E.D.})$

(b) $\because \overline{LE} \parallel \overline{XN}, \overline{XZ}$ is a transversal

$\therefore m(\angle XEL) = m(\angle NXZ)$ (alternate angles)

$\therefore m(\angle y)$ the inscribed $= m(\angle NXZ)$ of tangency

$\therefore m(\angle y) = m(\angle XEL)$

$\therefore$ the figure $LYZE$ is a cyclic quadrilateral.

(Q.E.D.)

11)(a) $\because \overline{AB}$ touches the circle at B $\therefore \overline{MB} \perp \overline{AB}$

$\because \overline{AC}$ touches the circle at C $\therefore \overline{MC} \perp \overline{AC}$

$\therefore (\angle ABM) + m(\angle ACM) = 90^\circ + 90^\circ = 180^\circ$

$\therefore$ the figure $ABMC$ is a cyclic quadrilateral.

(Q.E.D. 1)

$\because \angle CMD$ is an exterior angle of it

$\therefore m(\angle CMD) = m(\angle A) = 45^\circ$

In $\triangle MCD$: $m(\angle D) = 180^\circ - (90^\circ + 45^\circ) = 45^\circ$

$\therefore CD = MC \quad (1)$

$\because \overline{AC}, \overline{AB}$ are two tangent segments to the circle

$\therefore AC = AB \quad (2)$

Adding (1) and (2) : $\therefore CD + AC = MC + AB$

$\therefore AD = AB + MC,$

$\because MC = MB$ (the length of two radii)

$\therefore AD = AB + MB \quad (\text{Q. E.D.2})$

(b) In $\triangle CBD$: $\because CB = CD$

$\therefore m(\angle CBD) = m(\angle CDB) = 40^\circ$

$\therefore m(\angle C) = 180^\circ - 2 \times 40^\circ = 100^\circ$

$\therefore ABCD$ is a cyclic quadrilateral.

$\therefore m(\angle A) + m(\angle C) = 180^\circ$

$\therefore m(\angle A) = 180^\circ - 100^\circ = 80^\circ \quad (\text{The req.})$

12)(a) In the small circle

$\therefore m(\angle XAB)$ (the tangency angle)

$= m(\angle ADB)$ (the inscribed angle) (1)

In the great circle

$\therefore m(\angle XAC)$ (the tangency angle)

$= m(\angle AEC)$ (the inscribed angle) (2)

From (1) and (2) :

$\therefore m(\angle ADB) = m(\angle AEC)$ but they are corresponding.

$\therefore \overline{DB} \parallel \overline{EC} \quad (\text{Q.E.D.})$

(b) $\because AB = CD \quad \therefore m(\widehat{AB}) = m(\widehat{CD})$

Subtracting $m(\widehat{BD})$ from both sides

$\therefore m(\widehat{AD}) = m(\widehat{BC}) \quad \therefore m(\angle C) = m(\angle A)$

$\therefore \triangle ACE$ is isosceles (Q.E.D.)

13)(a) $\because \overline{MN}$ is the line of centers, $\overline{AB}$ is the common chord

$$\therefore \overline{AB} \perp \overline{MN} \quad \therefore m(\angle AEN) = 90^\circ$$

$\because$ The sum of the measures of the interior angles of the quadrilateral CDNE = 360°

$$\therefore m(\angle CDN) = 360^\circ - (55^\circ + 125^\circ + 90^\circ) = 90^\circ$$

$$\therefore \overline{ND} \perp \overline{CD}$$

$\therefore \overline{CD}$ is a tangent to the circle N at D (Q.E.D.)

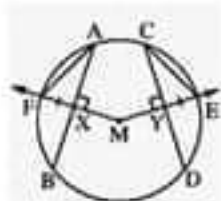
[b] $\because MF = ME$ (lengths of two radii)

$$\therefore XF = YE$$

$$\therefore MX = MY$$

$$\because \overline{MX} \perp \overline{AB}, \overline{MY} \perp \overline{CD}$$

$$\therefore AB = CD$$



(Q.E.D.1)

$$\because \overline{MX} \perp \overline{AB}$$

$$\therefore X \text{ is the midpoint of } \overline{AB} \quad \therefore AX = \frac{1}{2} AB$$

$$\because \overline{MY} \perp \overline{CD}$$

$$\therefore Y \text{ is the midpoint of } \overline{CD} \quad \therefore CY = \frac{1}{2} CD$$

$$\because AB = CD$$

$$\therefore AX = CY$$

$$\therefore \triangle AXF, \triangle CYE$$

$$\text{In them } \begin{cases} AX = CY \\ XF = YE \\ m(\angle AXF) = m(\angle CYE) = 90^\circ \end{cases}$$

$\therefore \triangle AXF \cong \triangle CYE$ then we deduce that $AF = CE$

(Q. E. D. 2)

$$14)(a) \because m(\angle E) = \frac{1}{2} [m(\widehat{BD}) - m(\widehat{AO})]$$

$$\therefore m(\angle E) = \frac{1}{2} m(\widehat{BD}) - \frac{1}{2} m(\widehat{AO})$$

$$\because m(\angle DCB) = \frac{1}{2} m(\widehat{BD})$$

$$\therefore m(\angle E) = m(\angle DCB) - \frac{1}{2} m(\widehat{AO})$$

$$\therefore m(\angle DCB) = m(\angle E) + \frac{1}{2} m(\widehat{AO})$$

$$\therefore m(\angle DCB) > m(\angle E) \quad (\text{Q. E. D.})$$

(b) $\because \angle ABE$ is an exterior angle of the cyclic quadrilateral ABCD

$$\therefore m(\angle d) = m(\angle ABE) = 100^\circ$$

$$\text{In } \triangle ACD : m(\angle ACD) = 180^\circ - (100^\circ + 40^\circ) = 40^\circ$$

$$\therefore m(\angle ACD) = m(\angle CAD)$$

$$\therefore CD = AD \quad \therefore m(\widehat{CD}) = m(\widehat{AD}) \quad (\text{Q.E.D.})$$

15)(a) an axis of symmetry.

$$(b) \because \overline{DE} \parallel \overline{BC} \quad \therefore m(\widehat{BD}) = m(\widehat{CE})$$

$$\therefore m(\angle DAB) = m(\angle CAE)$$

adding $m(\angle BAC)$ to both sides

$$\therefore m(\angle DAC) = m(\angle BAE) \quad (\text{Q. E. D.})$$

16)(a)

$\because \overline{LE} \parallel \overline{XN}, \overline{XZ}$ is a transversal

$$\because m(\angle XEL) = m(\angle NXZ) \text{ (alternate angles)}$$

$$\because m(\angle y) \text{ the inscribed} = m(\angle NXZ) \text{ of tangency}$$

$$\therefore m(\angle y) = m(\angle XEL)$$

$\therefore$ the figure LYZE is a cyclic quadrilateral

(Q. E. D.)

17)(a)

$\because \overline{CD}$ is a tangent to the circle

$\therefore \overline{MD} \perp \overline{CD} \therefore (\angle MDC) = 90^\circ$

$\because E$ is the midpoint of $\overline{AB}$

$\therefore \overline{ME} \perp \overline{AB}$

$\therefore m(\angle MEC) = 90^\circ$

$\therefore m(\angle DMF)$

$$= 360^\circ - (40^\circ + 90^\circ + 90^\circ)$$

$$= 360^\circ - 220^\circ = 140^\circ$$

$$\therefore AE = \frac{1}{2} AB = 8 \text{ cm}$$

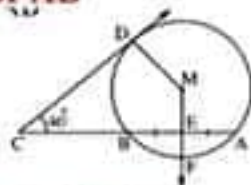
$$\therefore AM = r = 10 \text{ cm}$$

In $\triangle AEM$: $\because m(\angle AEM) = 90^\circ$

$$\therefore (ME)^2 = (AM)^2 - (AE)^2 = 100 - 64 = 36$$

$$\therefore ME = \sqrt{36} = 6 \text{ cm}$$

$$\therefore FE = MF - ME = 10 - 6 \text{ cm. (second req.)}$$



(b) $\therefore \overline{MN}$ is the line of centres

$\overline{AB}$ is the common chord of the two circles

$\therefore \overline{MN} \perp \overline{AB}$

$\because X$ is the midpoint of $\overline{AC}$

$\therefore \overline{MX} \perp \overline{AC}$

$\because AB = AC \therefore MX = MD$

$\because MY = ME$ (lengths of two radii)

$\therefore MY - MX = ME - MD$

$\therefore XY = DE$ (Q.E.D)

18)

$\because \overline{AB}$ is a diameter of the circle M

$\therefore m(\angle ADB) = 90^\circ$

In $\triangle ABD$: $\because m(\angle ABD) = 40^\circ$

$$\therefore m(\angle A) = 180^\circ - (90^\circ + 40^\circ) = 50^\circ$$

$\because ABCD$ is a cyclic quadrilateral

$$\therefore m(\angle C) + m(\angle A) = 180^\circ$$

$$\therefore m(\angle C) = 180^\circ - 50^\circ = 130^\circ \text{ (The req.)}$$

19) $\because \overline{DE} \parallel \overline{BC}$

$$\therefore m(\widehat{BD}) = m(\widehat{CE})$$

adding $m(\angle BAC)$ to both sides

$$\therefore m(\angle DAC) = m(\angle BAE) \text{ (Q.E.D.)}$$

20)(a)

$$\therefore m(\angle DMC) = 2 m(\angle CAD)$$

(central and inscribed angles subtended by $\widehat{CD}$)

$$\therefore m(\angle DMC) = 2 \times 30^\circ = 60^\circ$$

$\therefore \overline{AB} \parallel \overline{DM}$. $\overline{BC}$ is a transversal

$$\therefore m(\angle B) = m(\angle DMC)$$

$$= 60^\circ \text{ (corresponding angles)}$$

$\therefore \overline{BC}$ is a diameter of circle M

$$\therefore m(\angle BAC) = 90^\circ$$

$$\therefore \text{In } \triangle ABC: m(\angle ACB) = 180^\circ - (90^\circ + 60^\circ) = 30^\circ \text{ (The req.)}$$

(b)

$\because ABCD$ is a square. $\overline{AC}$

and $\overline{BD}$ are two diagonals of the square

$$\therefore m(\angle BAC) = m(\angle BDC)$$

$$\therefore \frac{1}{2} m(\angle BAC)$$

$$= \frac{1}{2} m(\angle BDC)$$

$$\therefore m(\angle XAY)$$

$$= m(\angle XDY) \text{ but they are drawn}$$

On $\overline{XY}$ and on one side of it

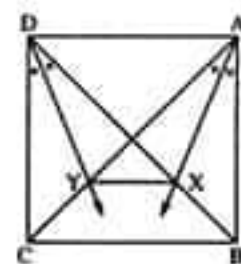
$\therefore$ The figure $AXYD$ is a cyclic quadrilateral

(Q.E.D. 1)

$$\therefore m(\angle DXY) = m(\angle DAY) = 45^\circ$$

(They are drawn on $\overline{DY}$ and on one side of it)

(Q.E.D. 2)



21)(a)

∵ $\overline{XY}, \overline{XZ}$ are tangent segments to the circle at Y and Z

∴ $XY = XZ$

$$\therefore m(\angle XYZ) = m(\angle XZY) = \frac{180^\circ - 80^\circ}{2} = 50^\circ$$

∴ $m(\angle ZEY)$ (the inscribed angle)
 $= m(\angle ZYX)$ (the tangency angle) $= 50^\circ$

∵ The figure LEYZ is a cyclic quadrilateral

$$\therefore m(\angle ZYE) = 180^\circ - 130^\circ = 50^\circ$$

$$\therefore m(\angle ZEY) = m(\angle ZYE) = 50^\circ$$

$$\therefore ZE = ZY \quad (\text{Q.E.D. 1})$$

∵ $m(\angle XZY) = m(\angle ZYE) = 50^\circ$
 but they are alternate angles

$$\therefore \overline{XZ} \parallel \overline{YE} \quad (\text{Q.E.D. 2})$$

$$\therefore \text{In } \triangle ZYE: m(\angle EYZ) = 180^\circ - 2 \times 50^\circ = 80^\circ$$

$$\therefore m(\angle EYZ) = m(\angle X) = 80^\circ$$

∴ $\overline{ZE}$ is a tangent to the circle passing through
 The points X, Y and Z (Q.E.D. 3)

22)(a)

∵ $\overline{AB}$ is a diameter

$$\therefore m(\angle C) = 90^\circ$$

$$\therefore \overline{MD} \perp \overline{AC}$$

$$\therefore m(\angle ADM) = m(\angle C) = 90^\circ$$

and they are corresponding angles

$$\therefore \overline{DM} \parallel \overline{BC} \quad (\text{Q.E.D. 1})$$

In $\triangle ABC$ which is right-angled at C

$$\therefore m(\angle A) = 30^\circ$$

$$\therefore BC = \frac{1}{2} AB$$

$= \text{radius length} \quad (\text{Q.E.D. 2})$

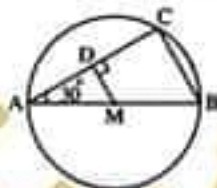
$$(b) \therefore MF = ME \quad (\text{Two radii}) \quad (1)$$

$$\therefore XF = YE \quad (\text{given}) \quad (2)$$

Subtracting (2) from (1):

$$\therefore MX = MY, \therefore \overline{MX} \perp \overline{AB}, \overline{MY} \perp \overline{CD}$$

$$\therefore AB = CD \quad (\text{Q.E.D.1})$$



$$\therefore \frac{1}{2} AB = \frac{1}{2} CD \quad \therefore AX = CY \quad (\text{Q.E.D.1})$$

∴ In $\triangle AXF, CYE$:

$$\begin{cases} AX = CY \\ XF = YE \\ m(\angle CYE) = m(\angle AXF) = 90^\circ \end{cases}$$

$$\therefore \triangle AXF \equiv \triangle CYE \quad \therefore AF = CE \quad (\text{Q.E.D. 2})$$

23)(a) Theoretical.

(b) ∵ (XZ) and (XY) are two tangents ∴ $XZ = XY$

$$\therefore m(\angle XZY) = \frac{180^\circ - 40^\circ}{2} = 70^\circ$$

$$\therefore m(\angle ZEY) \text{ the inscribed} \\ = m(\angle XZY) \text{ of tangency} \\ \therefore m(\angle ZEY) = 70^\circ \quad (1)$$

∴ DEYZ is a cyclic quadrilateral

$$\therefore m(\angle EYZ) = 180^\circ - 110^\circ = 70^\circ \quad (2)$$

From (1) and (2):

∴ $m(\widehat{ZE}) = m(\widehat{ZY})$ (Two arcs subtended by two equal inscribed angles in measure)

24)(a) ∵ $\overline{AB}$ is tangent to
 the circle M at B

$$\therefore \overline{MB} \perp \overline{AB}$$

∴ From $\triangle ABM$:

$$m(\angle BMA) = 180^\circ - (90^\circ + 40^\circ) = 50^\circ$$

$$\therefore m(\angle D) = \frac{1}{2} m(\angle BMC) = 25^\circ$$

(inscribed and central angles subtended by $\widehat{BC}$)

(b) In $\triangle AEC$: ∵ $EA = EC$

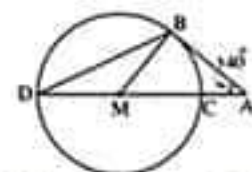
$$\therefore m(\angle BAC) = m(\angle DCA) \quad (1)$$

$$\therefore m(\angle BAD) = m(\angle DCB)$$

(inscribed angles subtended by $\widehat{BD}$) (2)

adding (1) and (2)

$$\therefore m(\angle CAD) = m(\angle ACB) \quad (\text{Q.E.D.})$$



25)(a)

∴ D is the midpoint of the chord $\overline{AC}$

∴ $\overline{MD} \perp \overline{AC}$.

∴ $\overline{BE}$ is tangent to the circle M at B

∴ $\overline{MB} \perp \overline{BE}$

∴ $m(\angle ADE) = m(\angle EBA) = 90^\circ$

and they are drawn on $\overline{AE}$ and on one side of it

∴ ADBE is a cyclic quadrilateral (Q. E. D. (1))

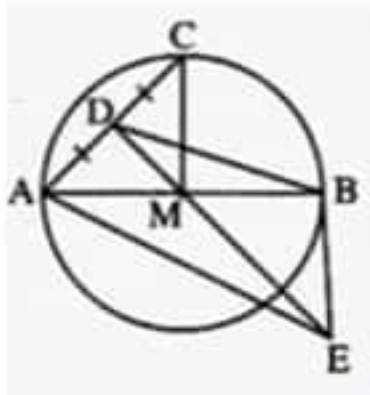
∴ $m(\angle BED) = m(\angle BAD)$

(are drawn on $\overline{BD}$ and on one side of it)

∴ $m(\angle CMB) = 2m(\angle CAB)$

(central and inscribed angles subtended by $\widehat{BC}$)

∴ $m(\angle CMB) = 2m(\angle MEB)$ (Q. E. D. 2)



Timss Problrms For prep 3

MR/Ahmed Shamekh

1 The acute angle supplements angle.

- (a) an acute (b) an obtuse (c) a right (d) a reflex

2 The number of diagonals of the hexagon equals

(Souhag)

- (a) 3 (b) 6 (c) 9 (d) 12

3 The number of axes of symmetry of the opposite shape is

(Qairo)

- (a) 1 (b) 2 (c) 3 (d) 4



4 The ratio between the area of a square region of side length L cm. and the area of a square region of side length 2L cm. is

(E-Fayoum)

- (a) 1 : 2 (b) L : 4 (c) 1 : 4 (d) 4 : 1

5 The opposite figure represents a quarter of a circle of radius length 2 cm., then the perimeter of the figure in centimetres is



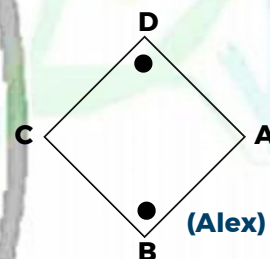
(El-Menia)

- (a) 2π (b) 5π (c) $\pi + 4$ (d) $4\pi + 4$

6 The area of a square whose side length is an integer may be cm^2

(Giza)

- (a) 600 (b) 900 (c) 800 (d) 700

7 In the opposite figure :
If $m(\angle A) + m(\angle C) = 140^\circ$, $m(\angle B) = m(\angle D)$,
then $m(\angle B) =$ 

(Alex)

- (a) 50° (b) 55° (c) 110° (d) 220°

8 If the side length of a square is $2\sqrt{2}$ cm., then its area equals its angle.

(El-Menia)

- (a) 4 cm^2 (b) 8 cm^2 (c) $4\sqrt{2} \text{ cm}^2$ (d) $8\sqrt{2} \text{ cm}^2$

9 If the lengths of two sides of a triangle are 3 cm. and 7 cm., then which of the following can not be the length of the third side ?

(El-Beheira)

- (a) 7 cm (b) 8 cm (c) 9 cm (d) 3 cm

10 A circle, its area is $64\pi \text{ cm}^2$, then its circumference equals

(Matroh)

- (a) 8 cm (b) $8\pi \text{ cm}$ (c) $16\pi \text{ cm}$ (d) $32\pi \text{ cm}$

- 11 If the height of a triangle equals half the length of its base, and the length of its base is L cm., then the area of this triangle = (Alex)
- (a) $\frac{1}{2} L \text{ cm}^2$ (b) $\frac{1}{2} L^2 \text{ cm}^2$ (c) $\frac{1}{4} L \text{ cm}^2$ (d) $\frac{1}{4} L^2 \text{ cm}^2$
- 12 If the perimeter of a square equals $(3X - 4)$ cm. and the area of this square equals 25 cm^2 , then $X =$ (El-Beheira)
- (a) 5 (b) 6 (c) 8 (d) 20
- 13 If the area of one face of a cube equals 9 cm^2 , then the volume of this cube equals (Giza)
- (a) 9 cm^3 (b) 27 cm^3 (c) 36 cm^3 (d) 81 cm^3
- 14 In the parallelogram ABCD, if $\angle A$ is acute, then $\angle C$ is (Luxor)
- (a) acute. (b) obtuse. (c) right. (d) reflex.
- 15 The number of diagonals of the pentagon equals (Ismailia)
- (a) 3 (b) 5 (c) 7 (d) 9
- 16 The image of the point $(-1, 3)$ by the translation $(4, -2)$ is (Matroh)
- (a) $(3, -1)$ (b) $(3, 1)$ (c) $(5, 1)$ (d) $(5, -5)$
- 17 The measure of the angle of the regular octagon equals (Souhag)
- (a) 108° (b) 120° (c) 135° (d) 144°
- 18 A rectangle, its length is 4 cm . and its width is 3 cm ., then the length of its diagonal equals (Qairo)
- (a) 14 cm (b) 12 cm (c) 7 cm (d) 5 cm
- 19 The ratio between the side length of a rhombus and its perimeter equals (El-Menia)
- (a) $1:1$ (b) $1:2$ (c) $1:4$ (d) $4:1$
- 20 A square is of area 144 cm^2 , then its perimeter = (Damietta)
- (a) 12 (b) 48 (c) 288 (d) 576
- 21 A rectangle, its length is 6 cm . and its perimeter is 16 cm ., then its area is (Qairo)
- (a) 10 (b) 8 (c) 12 (d) 16

- 22 The supplementary of the angle whose measure is 30° , is an angle of measure
(E-Fayoum)

(a) 30° (b) 60° (c) 120° (d) 150°

- 23 The area of the shaded part from the area of the figure =

(a) $\frac{1}{8}$ (b) $\frac{1}{2}$
(c) $\frac{3}{8}$ (d) $\frac{3}{4}$



(El-Beheira)

- 24 If X is an angle, then $m(\angle X) + m(\text{reflex } \angle X) = \dots\dots\dots$

(Matroh)

(a) two right angles. (b) three right angles.
(c) five right angles. (d) four right angles.

- 25 A square its side length is a whole number, then its perimeter can be

(El-Gharbia)

(a) 33 cm (b) 44 cm (c) 55 cm (d) 66 cm

- 26 The number of axes of symmetry of the opposite figure is

(a) 1 (b) 2
(c) 3 (d) an infinite number



(Alex)

- 27 The number of diagonals of the hexagon is

(Ismailia)

(a) 6 (b) 3 (c) 12 (d) 9

- 28 The two angles of base of an isosceles triangle are.....

(Suez)

(a) congruent (b) supplementary
(c) vertically opposite angles. (d) corresponding

- 29 The measure of an exterior angle of an equilateral triangle is

(Damietta)

(a) 60° (b) 150° (c) 120° (d) 30°

- 30 The number of axes of symmetry of the isosceles triangle equals

(Qairo)

(a) 0 (b) 1 (c) 2 (d) 3

- 31 The triangle whose side lengths are 5 cm., 12 cm. and 13 cm., its area = cm^2
(Souhag)
 (a) 30 (b) 32.5 (c) 78 (d) 144
- 32 In any triangle, the sum of the lengths of any two sides is the length of the third side.
(El-Gharbia)
 (a) greater than (b) smaller than (c) equal to (d) half
- 33 The point of concurrence of the medians of the triangle divides the median in the ratio of from the base.
(E-Fayoum)
 (a) 1 : 3 (b) 2 : 1 (c) 3 : 1 (d) 1 : 2
- 34 The sum of the measures of the accumulative angles at a point equals
(El-Menia)
 (a) 90° (b) 180° (c) 270° (d) 360°
- 35 If ABCD is a square, then $m(\angle CAB) =$
(El-Beheira)
 (a) 90° (b) 45° (c) 60° (d) 30°
- 36 If the lengths of the diagonals of a rhombus are 6 cm., 10 cm. , then its area equals cm^2
(Luxor)
 (a) 30 (b) 60 (c) 15 (d) 10
- 37 The image of the point (-4 , 5) by the translation (2 , -3) is
(El-Menia)
 (a) (-2 , -2) (b) (2 , -2) (c) (2 , 2) (d) (-2 , 2)
- 38 The image of the point (-2 , 5) by reflection in X-axis is
(Alex)
 (a) (-2 , -5) (b) (2 , 5) (c) (2 , -5) (d) (5 , -2)
- 39 The quadrilateral whose diagonals are equal in length and perpendicular is the
(Giza)
 (a) square (b) rhombus
 (c) rectangle (d) parallelogram
- 40 The volume of the cuboid whose dimensions are $\sqrt{2}$, $\sqrt{3}$, 6 centimetres equals cm^3
(Qairo)
 (a) $2\sqrt{6}$ (b) $3\sqrt{6}$ (c) $3\sqrt{2}$ (d) $6\sqrt{6}$

41 If 3, 7, L are lengths of sides of a triangle, then L may be equal to
 (a) 3 (b) 4 (c) 7 (d) 10 (El-Menia)

42 ΔABC is a triangle, $(\angle B) = 3$ m $(\angle A) = 90^\circ$, then $m(\angle C) =$
 (a) 30° (b) 45° (c) 60° (d) 90° (Matroh)

43 ABC is a triangle, if $m(\angle B) > m(\angle C)$, then
 (a) $AC - AB < 0$ (b) $AC - AB \leq 0$ (c) $BC \leq AB$ (d) $AC - AB > 0$ (Ismailia)

44 The circumference of the circle with diameter length 14 cm. is cm. (where $\pi = \frac{22}{7}$)
 (a) 7 (b) 22 (c) 44 (d) 14 (El-Beheira)

45 If $m(\angle X) = m(\angle Y)$, $\angle X, \angle Y$ are complementary, then $m(\angle X) =$
 (a) 90° (b) 60° (c) 45° (d) 30° (Souhag)

46 If $\overleftrightarrow{XY}$ is the axis of symmetry of $\overline{AB}$, then XA XB
 (a) $<$ (b) $>$ (c) $=$ (d) $\perp$ (E-Fayoum)

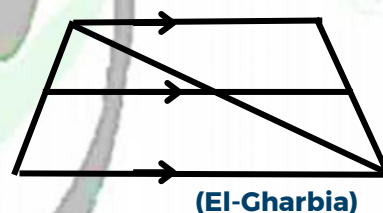
47 ABCD is a parallelogram in which $m(\angle A) + m(\angle C) = 200^\circ$, then $m(\angle B) =$
 (a) 50° (b) 80° (c) 100° (d) 160° (Alex)

48 If ABCD is a parallelogram, then $AB + CD =$
 (a) 2AC (b) 2BC (c) 2BD (d) 2CD (Damietta)

49 If $L_1 \parallel L_2, L_3 \perp L_1, L_4 \perp L_2$, then
 (a) $L_2 \parallel L_3$ (b) $L_1 \parallel L_4$ (c) $L_3 \parallel L_4$ (d) $L_3 \parallel L_4$ (El-Menia)

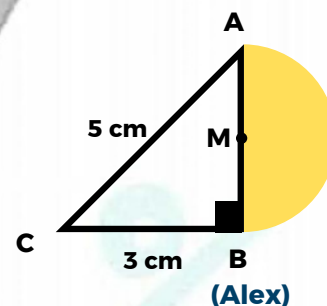
50 In the opposite figure :
 The number of trapeziums =

- (a) 2 (b) 3
 (c) 4 (d) 5



51 In the opposite figure :
 $\overline{AB}$ is a diameter of a circle,
 then the surface area of the shaded shape = cm^2

- (a) 4π (b) 16π
 (c) 2π (d) 9π



52 In the opposite figure :

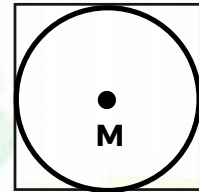
If the side length of the square = 10 cm. , then the area of the circle = cm².

(a) 100π

(b) 25π

(c) 50π

(d) 40π



(Giza)

53 In the opposite figure :

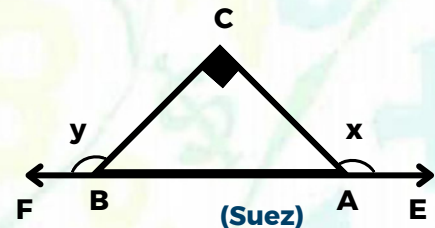
If $A \in \overline{EF}$, $B \in \overline{EF}$, $m(\angle C) = 90^\circ$
, then $X + y = \dots\dots\dots$

(a) 90°

(b) 180°

(c) 270°

(d) 360°



(Suez)

54 The corresponding angles of the two similar polygons are in measure.

(a) equal

(b) different

(c) proportional

(d) alternate

(Qairo)

55 The medians of a triangle meet at the same point which divides each in the ratio from the vertex.

(El-Menia)

(a) 1 : 2

(b) 2 : 1

(c) 1 : 3

(d) 3 : 2

56 If the projection of a line segment on a straight line is a point, then the line segment the straight line.

(Matroh)

(a) //

(b) $\perp$

(c) $\in$

(d) $\subset$

57 ABC is a right-angled triangle at B where $AB = 6$ cm., $BC = 8$ cm., then its area = cm²

(El-Gharbia)

(a) 48

(b) 14

(c) 24

(d) 7

58 A rectangle has a length of 8 cm., and a surface area of 16 cm², then its width = cm.

(Qairo)

(a) 48

(b) 2

(c) 3

(d) 64

59 The length of the side opposite to the angle of measure 30° in the right-angled triangle equals the length of the hypotenuse.

(Ismailia)

(a) $\frac{1}{2}$

(b) $\frac{\sqrt{3}}{2}$

(c) $\sqrt{2}$

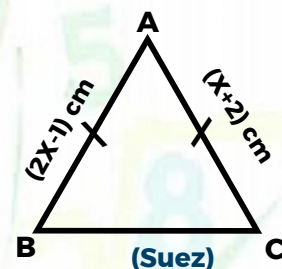
(d) 7

- 60 The image of the point (2 , 3) by rotation $R(O, 180^\circ)$ is the point (Luxor)
 (a) (2 , 3) (b) (-2 , 3) (c) (2 , -3) (d) (-2 , -3)
- 61 If the side length of a rhombus is L cm., then its perimeter = cm (El-Beheira)
 (a) L^2 (b) $2L^2$ (c) $4L$ (d) $2\sqrt{2}L$
- 62 The measure of the interior angle of the regular hexagon = (Souhag)
 (a) 60° (b) 108° (c) 120° (d) 135°
- 63 If M is a circle of radius length r cm., then the length of the semicircle cm. (Alex)
 (a) $2\pi r$ (b) $\frac{1}{4}\pi r$ (c) $\frac{1}{2}\pi r$ (d) πr
- 64 A square is of perimeter 20 cm., then its area = cm^2 (Matroh)
 (a) 20 (b) 25 (c) 50 (d) 100
- 65 The two diagonals are equal in length and not perpendicular in the (El-Menia)
 (a) square (b) rhombus
 (c) rectangle (d) parallelogram
- 66 ΔABC is a right-angled triangle at C, then the two angles A and B are (E-Fayoum)
 (a) supplementary. (b) complementary.
 (c) adjacent. (d) vertically opposite angles.
- 67 Two parallel lines to a third are (El-Menia)
 (a) perpendicular (b) parallel
 (c) intersecting (d) skew
- 68 The number of symmetry axes of the square is (Qairo)
 (a) 1 (b) 2 (c) 3 (d) 4
- 69 The numbers 5 , 4 and can be side lengths of a triangle. (Suez)
 (a) 8 (b) 9 (c) 10 (d) 12
- 70 ΔXYZ is a right-angled triangle at Y, then XZ YZ (El-Gharbia)
 (a) < (b) > (c) = (d) is twice

71 In the opposite figure :

If $AB = AC$, $AB = (2X-1)$ cm. and $AC = (X+2)$ cm. ,
then $X = \dots\dots\dots$

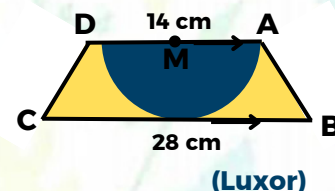
- (a) 3 (b) 5
(c) 11 (d) 14



72 In the opposite figure :

$ABCD$ is a trapezium in which $\overline{AD} \parallel \overline{BC}$ and $\overline{AD}$ is a diameter of circle M , then the area of the shaded region =

- (a) 70 cm^2 (b) 147 cm^2
(c) 170 cm^2 (d) 224 cm^2



73 ABC is a triangle having one symmetric axis and its side lengths are 10 , 5 and X cm. , then $X = \dots\dots\dots$ cm.

- (a) 5 (b) 8 (c) 10 (d) 12

74 The distance between the point $(7,4)$ and y -axis equals length unit.

- (a) -7 (b) -4 (c) 4 (d) 7

75 The number of altitudes of the isosceles triangle equals

- (a) zero (b) 1 (c) 2 (d) 3

76 If the two adjacent angles are complementary, then the outer sides of them are

- (a) parallel. (b) including an acute angle.
(c) perpendicular. (d) collinear.

77 $ABCD$ is a parallelogram, $m(\angle A) + m(\angle C) = 200^\circ$, then $m(\angle B) = \dots\dots\dots$

- (a) 50° (b) 80° (c) 100° (d) 160°

78 The number of axes of symmetry of the semicircle equals

- (a) 0 (b) 1 (c) 2 (d) an infinite number.

79 A triangle has only one axis of symmetry and two side lengths of its

sides are 4 cm. ,8 cm., then the length of its third side is cm

- (a) 5 (b) 12 (c) 4 (d) 8

- 80 If the two vertically opposite angles are supplementary , then the measure of each one is (Matroh)
- (a) 45° (b) 180° (c) 90° (d) 60°
- 81 If $\overline{AB} = \overline{XY}$, then $\frac{3 \overline{AB}}{5 \overline{XY}} = \dots\dots\dots$ (Souhag)
- (a) 1 (b) 0.6 (c) zero (d) 1.7
- 82 The number of axes of symmetry of the equilateral triangle is (Luxor)
- (a) zero (b) 1 (c) 2 (d) 3
- 83 If the point A lies on the axis of symmetry of $\overline{XY}$, then $\overline{AX} \dots\dots\dots \overline{AY}$ (Damietta)
- (a) $//$ (b) $\perp$ (c) $=$ (d) $\equiv$
- 84 If $\Delta ABC = \Delta XYZ$, then $\overline{AB} \dots\dots\dots \overline{XY}$ (El-Menia)
- (a) $<$ (b) $=$ (c) $\equiv$ (d) $>$
- 85 If ABCD is a rhombus, $m(\angle A) + m(\angle C) = 140^\circ$, then $m(\angle A) = \dots\dots\dots$ (El-Beheira)
- (a) 70° (b) 40° (c) 110° (d) 220°
- 86 The angle whose measure is more than 90° and less than 180° is angle. (El-Menia)
- (a) an obtuse (b) an acute (c) a right (d) a straight
- 87 The acute angle is complemented by an angle (Qairo)
- (a) acute. (b) right. (c) obtuse. (d) reflex.
- 88 The sum of the measures of the interior angles of a pentagon equals (Souhag)
- (a) 36° (b) 72° (c) 108° (d) 540°
- 89 The angle whose measure is $89^\circ 59'$ is (Ismailia)
- (a) acute. (b) right. (c) obtuse. (d) reflex.
- 90 The perimeter of the square whose surface area is 100 cm^2 equals cm. (El-Monofia)
- (a) 10 (b) 20 (c) 40 (d) 50
- 91 If the lengths 3,7, L are lengths of sides of a triangle, then L can be equal to (El-Gharbia)
- (a) 3 (b) 7 (c) 4 (d) 10
- 92 The length of any side of a triangle the sum of lengths of the other two sides. (Luxor)
- (a) $>$ (b) $\geq$ (c) $<$ (d) $=$

93 In a parallelogram, the diagonals are

(Matroh)

- ☐ a perpendicular. ☐ b equal in length.
☐ c bisecting each other. ☐ d perpendicular and equal in length.

94 A circle has a surface area of $4\pi \text{ cm}^2$, then its radius length is cm

(El-Menia)

- ☐ a 2 ☐ b 4 ☐ c 2π ☐ d 4π

95 The two perpendicular straight lines to a third in the same plane are

(Alex)

- ☐ a parallel. ☐ b intersecting.
☐ c perpendicular. ☐ d intersecting on perpendicular.

96 The number of the axes of symmetry of the circle equals

(Suez)

- ☐ a 1 ☐ b 2 ☐ c 3 ☐ d an infinite number.

97 All are similar.

- ☐ a the squares ☐ b the triangles
☐ c the rectangles ☐ d the parallelograms

98 The bisectors of two adjacent supplementary angles.

(Alex)

- ☐ a are perpendicular. ☐ b are parallel.
☐ c are coincident. ☐ d have an acute angle between them.

99 If $m(\text{reflex } \angle A) = 3m(\angle A)$, then $m(\text{reflex } \angle A) = \dots\dots\dots^\circ$

(Giza)

- ☐ a 360 ☐ b 120 ☐ c 90 ☐ d 270

100 The number of the axes of symmetry of the scalene triangle equals

(Qairo)

- ☐ a 3 ☐ b zero ☐ c 2 ☐ d 1

Answers of accumulative basic skills

1	b	21	c	41	c	61	c	81	b
2	c	22	d	42	c	62	c	82	d
3	b	23	b	43	d	63	d	83	d
4	c	24	d	44	c	64	b	84	c
5	c	25	b	45	c	65	c	85	a
6	b	26	a	46	c	66	b	86	a
7	c	27	d	47	b	67	b	87	a
8	b	28	a	48	d	68	d	88	d
9	d	29	c	49	c	69	a	89	a
10	c	30	b	50	d	70	b	90	c
11	d	31	a	51	c	71	a	91	b
12	c	32	a	52	b	72	b	92	a
13	b	33	d	53	c	73	c	93	c
14	a	34	d	54	a	74	d	94	a
15	b	35	b	55	b	75	d	95	a
16	b	36	a	56	c	76	c	96	d
17	c	37	d	57	c	77	b	97	a
18	d	38	a	58	b	78	b	98	a
19	c	39	a	59	a	79	d	99	d
20	b	40	d	60	d	80	c	100	b

حمل الآن

مجانا وحصريا

المراجعة رقم (3)

الترم الثاني



Accumulative Questions in Algebra

- 1) Twice of number $2^{14} = 2 \dots$
- 2) Quarter of number $2^{20} = 2 \dots$
- 3) $3^5 + 3^5 + 3^5 = 3 \dots\dots$
- 4) If $3^{X-2} = 1$, then $X = \dots\dots$
- 5) If $2^{X-1} = 16$, then $X = \dots\dots$
- 6) If $5^X = 3$, then $5^{X-1} = \dots\dots$
- 7) If $3^{X+1} = 12$, then $3^X = \dots\dots$
- 8) If $(x-3)^{\text{zero}} = 1$, then $X \in \dots\dots$
- 9) If $2^X = 3$, then $8^X = \dots\dots$
- 10) If $(\frac{5}{3})^x = (\frac{3}{5})^2$, then $x = \dots\dots$
- 11) If $2^X = \frac{1}{8}$, then $X = \dots\dots$
- 12) If $7^{x-3} = 5^{x-3}$, then $x = \dots\dots$
- 13) $2^{12} \times 3^{12} = 6 \dots\dots$
- 14) $\sqrt{100-64} = 10 - \dots\dots\dots$
- 15) If $X < \sqrt{51} < X+1$, $X \in \mathbb{Z}$, then $X = \dots\dots\dots$
- 16) $\sqrt{4} = \sqrt[3]{\dots}$
- 17) The additive identity is and the multiplicative identity is
The number has no multiplicative inverse

Accumulative Questions in Algebra

- 18) The additive inverse of number $(-5)^{\text{zero}}$ is
- 19) The multiplicative inverse of number 1.7
- 20) $|-2| = \dots\dots\dots$, $|x| = 7$, then $x = \dots\dots\dots$
- 21) The number 56.846 to the nearest 0.01 =
- 22) The degree of term $2X^3 Y^2 Z$ is
- 23) The degree of expression $3X^2 + XY^2 - 5Y^2$ is
- 24) Subtract $-4X$ from $3X = \dots\dots\dots$
- 25) $(-5a)$ increased by $(-3a) = \dots\dots\dots$
- 26) $\frac{Y^5}{Y^3} + Y^2 = \dots\dots\dots$
- 27) The middle term of in the expansion $(2X - 3Y)^2$ is
- 28) The middle term of in the expansion $(X - 4)(3X + 5)$ is ...
- 29) If $X^2 + kX + 25$ is a perfect square , then $k = \dots\dots\dots$
- 30) The H.C.F of expression $8X^2Y + 16XY^2$ is
- 31) If $5a = 45$, $ab = 1$, then $b = \dots\dots\dots$
- 32) If $A + B = 4$, then $3A + 3B = \dots\dots\dots$
- 33) If $A + B = AB = 5$, then $A^2 B + A B^2 = \dots\dots\dots$
- 34) If $X^2 - Y^2 = 20$, $X - Y = 5$, then $X + Y = \dots\dots\dots$
- 35) If $X^2 + Y^2 = 10$, $XY = 2$, then $(X - Y)^2 = \dots\dots\dots$

Accumulative Questions in Algebra

- 36) If $(X + Y)^2 = 20$, $XY = 3$, then $X^2 + Y^2 = \dots\dots$
- 37) If $(X-3)(X+3) = X^2 - k$, then $K = \dots\dots$
- 38) The number $0.\dot{3}$ in form $\frac{a}{b}$ is $\dots\dots\dots$
- 39) The number of rational numbers lie between $\frac{3}{7}$, $\frac{5}{7}$
- 40) The number lies at half distance between $\frac{1}{3}$, $\frac{5}{9}$
- 41) The irrational number lies between 3 and 4 is ..(3.5 , $\sqrt{8}$, $\sqrt{5}$, $\sqrt[3]{29}$)
- 42) The number $\frac{X+5}{X-2}$ is a rational number if $X \neq \dots\dots$
- 43) The number $\frac{4X}{X+1} = 0$, if $X = \dots\dots$
- 44) $\frac{3}{5} = \dots\dots\%$, 20 % of 240 = $\dots\dots$
- 45) The conjugate number of $\sqrt{5} - 2$ is $\dots\dots\dots$, its additive inverse is $\dots\dots$ and its multiplicative inverse is $\dots\dots$
- 46) A cube whose volume is 8 cm^3 then , it edge length = ...
Base area = $\dots\dots$ Lateral area = $\dots\dots$ total area = $\dots\dots$
Sum of edge length = $\dots\dots$
- 47) The S.S of $X^2 - 9 = 0$ in R is $\dots\dots\dots$
- 48) The S.S of $X^2 + 25 = 0$ in R is $\dots\dots\dots$
- 45) The S.S of $3 < X < 4$ where $X \in N$ is $\dots\dots\dots$
- 46) The S.S of $5 - X \leq 2$ where $X \in R$ is $\dots\dots\dots$

Accumulative Questions in Algebra

47) If $1 < X < 3$, $X \in \mathbb{R}$, then $3X-1 \in \dots\dots\dots$

48) $\mathbb{R}$ in interval form = $\dots\dots\dots$

49) $\mathbb{R}_+$ in interval form = $\dots\dots\dots$

50) The non positive real number in interval = $\dots\dots\dots$

51) $[-3,2] - \{-3\} = \dots\dots\dots$

52) $[-2,5] - \{-2,5\} = \dots\dots\dots$

53) $[3,7] -]3,7[= \dots\dots\dots$

54) $] -3,2 [\cup \{ 2 \} = \dots\dots\dots$

55) $] -3,2 [\cup \{-3, 2\} = \dots\dots\dots$

56) $] -3,2 [\cap \{-3, 2\} = \dots\dots\dots$

57) $] -3,2 [\cap \{-3, 2\} = \dots\dots\dots$

58) Choose: $\{3\} \subset (3,7)$, $]3,7[\subset \{3,7\}$

59) $\emptyset \dots\dots\dots \{ 1,5\}$ ($\in$, $\notin$, $\subset$, $\not\subset$)

60) The sum of two square roots of the number 4 = $\dots\dots\dots$

61) The prime number whose the sum of its factors 8 is $\dots\dots\dots$

62) The sum of numbers in the interval $] -3,3 [= \dots\dots\dots$

63) $\mathbb{Q} \cup \mathbb{Q}^{\leq} = \dots\dots\dots$, $\mathbb{Q} \cap \mathbb{Q}^{\leq} = \dots\dots\dots$

64) $\mathbb{R}_+ \cup \mathbb{R}_- = \dots\dots\dots$, $\mathbb{R}_+ \cap \mathbb{R}_- = \dots\dots\dots$

65) $\mathbb{R} - \mathbb{Q} = \dots\dots\dots$, $\mathbb{R} - \mathbb{Q}^{\leq} = \dots\dots\dots$

شرح خطوات الحل على قناة



Math For Kids: Hoda Ismail

Accumulative Questions in Algebra

- 1) Twice of number $2^{14} = 2^{\dots}$ **15**
- 2) Quarter of number $2^{20} = 2^{\dots}$ **18**
- 3) $3^5 + 3^5 + 3^5 = 3^{\dots}$ **6**
- 4) If $3^{X-2} = 1$, then $X = \dots$ **2**
- 5) If $2^{X-1} = 16$, then $X = \dots$ **5**
- 6) If $5^X = 3$, then $5^{X-1} = \dots$ **$\frac{3}{5}$**
- 7) If $3^{X+1} = 12$, then $3^X = \dots$ **4**
- 8) If $(x-3)^{\text{zero}} = 1$, then $X \in \dots$ **$\mathbb{R} - \{3\}$**
- 9) If $2^X = 3$, then $8^X = \dots$ **27**
- 10) If $(\frac{5}{3})^x = (\frac{3}{5})^2$, then $x = \dots$ **-2**
- 11) If $2^X = \frac{1}{8}$, then $X = \dots$ **-3**
- 12) If $7^{x-3} = 5^{x-3}$, then $x = \dots$ **3**
- 13) $2^{12} \times 3^{12} = 6^{\dots}$ **12**
- 14) $\sqrt{100-64} = 10 - \dots$ **4**
- 15) If $X < \sqrt{51} < X+1$, $X \in \mathbb{Z}$, then $X = \dots$ **7**
- 16) $\sqrt{4} = \sqrt[3]{\dots}$ **8**
- 17) The additive identity is **zero** and the multiplicative identity is **1**
 , The number has no multiplicative inverse **zero**

Accumulative Questions in Algebra

- 18) The additive inverse of number $(-5)^{\text{zero}}$ is **-1**
- 19) The multiplicative inverse of number 1.7 **$\frac{10}{17}$**
- 20) $|-2| =$ **2**.... , $|x| = 7$, then $x =$ **± 7** ...
- 21) The number 56.846 to the nearest 0.01 = **56.85**
- 22) The degree of term $2X^3 Y^2 Z$ is **6**..
- 23) The degree of expression $3X^2 + XY^2 - 5Y^2$ is **Third**
- 24) Subtract $-4X$ from $3X =$ **$7X$**
- 25) $(-5a)$ increased by $(-3a) =$ **$-2a$**
- 26) $\frac{Y^5}{Y^3} + Y^2 =$ **$Y^2 + Y^2 = 2Y^2$**
- 27) The middle term of in the expansion $(2X - 3Y)^2$ is **$-12xy$**
- 28) The middle term of in the expansion $(X - 4)(3X + 5)$ is ... **$-7X$**
- 29) If $X^2 + kX + 25$ is a perfect square , then $k =$ **± 10** ..
- 30) The H.C.F of expression $8X^2Y + 16XY^2$ is **$8xy$**
- 31) If $5a = 45$, $ab = 1$, then $b =$ **$\frac{1}{9}$** ..
- 32) If $A + B = 4$, then $3A + 3B =$ **$3 \times 4 = 12$**
- 33) If $A + B = AB = 5$, then $A^2 B + A B^2 =$ **$AB(A+B) = 5 \times 5 = 25$**
- 34) If $X^2 - Y^2 = 20$, $X - Y = 5$, then $X + Y =$ **$20 \div 5 = 4$**
- 35) If $X^2 + Y^2 = 10$, $XY = 2$, then $(X - Y)^2 =$ **$10 - 2 \times 2 = 6$**

Accumulative Questions in Algebra

- 36) If $(X + Y)^2 = 20$, $XY = 3$, then $X^2 + Y^2 = 20 - 2 \times 3 = 14$
- 37) If $(X-3)(X+3) = X^2 - k$, then $K = 9$
- 38) The number $0.\dot{3}$ in form $\frac{a}{b}$ is $\frac{1}{3}$
- 39) The number of rational numbers lie between $\frac{3}{7}$, $\frac{5}{7}$ in finite
- 40) The number lies at half distance between $\frac{1}{3}$, $\frac{5}{9}$ $\frac{4}{9}$
- 41) The irrational number lies between 3 and 4 is ..(3.5 , $\sqrt{8}$, $\sqrt{5}$, $\sqrt[3]{29}$)
- 42) The number $\frac{X+5}{X-2}$ is a rational number if $X \neq 2$
- 43) The number $\frac{4X}{X+1} = 0$, if $X = \text{Zero}$
- 44) $\frac{3}{5} = 60\%$, 20 % of 240 = 48..
- 45) The conjugate number of $\sqrt{5} - 2$ is $\sqrt{5} + 2$, its additive inverse is $-\sqrt{5} + 2$ and its multiplicative inverse is $\sqrt{5} + 2$
- 46) A cube whose volume is 8 cm^3 then , its edge length = 2.
Base area = 4 cm^2 Lateral area = 16 cm^2 total area = 24 cm^2
Sum of edge length = 24 cm
- 47) The S.S of $X^2 - 9 = 0$ in R is $\{3, -3\}$
- 48) The S.S of $X^2 + 25 = 0$ in R is $\emptyset$
- 45) The S.S of $3 < X < 4$ where $X \in \mathbb{N}$ is $\emptyset$
- 46) The S.S of $5 - X \leq 2$ where $X \in \mathbb{R}$ is $[3, \infty[$

Accumulative Questions in Algebra

47) If $1 < X < 3$, $X \in \mathbb{R}$, then $3X-1 \in \dots$ **$]2, 8[$**

48) $\mathbb{R}$ in interval form = **$] -\infty, \infty[$** 49) $\mathbb{R}_+$ in interval form = **$]0, \infty[$**

50) The non positive real number in interval = **$] -\infty, 0]$**

51) $[-3, 2] - \{-3\} =$ **$] -3, 2]$**

52) $[-2, 5] - \{-2, 5\} =$ **$] -2, 5[$**

53) $[3, 7] -]3, 7[=$ **$\{3, 7\}$**

54) $] -3, 2[\cup \{2\} =$ **$] -3, 2]$**

55) $] -3, 2[\cup \{-3, 2\} =$ **$[-3, 2]$**

56) $] -3, 2[\cap \{-3, 2\} =$ **$\{2\}$**

57) $] -3, 2[\cap \{-3, 2\} =$ **$\emptyset$**

58) Choose: $\{3\} \subset (3, 7)$, $]3, 7]$ **$\{3, 7\}$**

59) $\emptyset \dots \{1, 5\}$ ($\in$, $\notin$, **$\subset$** , $\nsubseteq$)

60) The sum of two square roots of the number 4 = **$2\sqrt{2}$**

61) The prime number whose the sum of its factors 8 is **7**

62) The sum of numbers in the interval $] -3, 3]$ = **3** ...

63) $\mathbb{Q} \cup \mathbb{Q} =$ **$\mathbb{R}$** , $\mathbb{Q} \cap \mathbb{Q} =$ **$\mathbb{Q}$**

64) $\mathbb{R}_+ \cup \mathbb{R}_- =$ **$\mathbb{R}^*$** , $\mathbb{R}_+ \cap \mathbb{R}_- =$ **$\emptyset$**

65) $\mathbb{R} - \mathbb{Q} =$ **$\mathbb{R} \setminus \mathbb{Q}$** , $\mathbb{R} - \mathbb{Q} =$ **$\mathbb{Q}$**

شرح خطوات الحل على قناة



Math For Kids: Hoda Ismail

Accumulative Questions in Geometry

1) The types of angles (zero, acute , right , obtuse , straight , reflex)

- The type of the angle of measure 75° is
- The type of the angle of measure 200° is
- The type of the angle of measure 90° is
- The type of the angle of measure 180° is
- The type of the angle of measure 95° is
- The type of the angle of measure $89^\circ 62'$ is

2) The sum of measures of complementary angles =..... $^\circ$

3) The sum of measures of supplementary angles =..... $^\circ$

4) The sum of measures of accumulative angles at a point =..... $^\circ$

- if the measure of an angle is 65° , then it complements angle, supplements angle, and its reflex angle =
- if the ratio between two complementary angles is $7 : 11$ then the measure of smaller angle =

5) If the two adjacent angles are complementary , then the outer sides of them are

6) If the two adjacent angles are supplementary , then the outer sides of them are

7) Each two vertically opposite angles are

8) The sum of measures of exterior angles of any polygon =..... $^\circ$

9) The sum of measures of interior angles of triangle = $^\circ$

10) The sum of measures of interior angles of a quadrilateral =..... $^\circ$

11) The sum of measures of interior angles of a pentagon =..... $^\circ$

The measure of interior angle of regular pentagon =

Accumulative Questions in Geometry

- 12) The sum of measures of interior angles of a hexagon =.....°
The measure of interior angle of regular hexagon =
- 13) The number of diagonals of a quadrilateral , a pentagon ,
a hexagon , a triangle
- 14) The number of axes of symmetry of Square has , Equilateral triangle
has Rectangle has , Rhombus has , isosceles triangle has
isosceles trapezium has , trapezium has , Parallelogram has
Scalene triangle has..... , circle has
- 15) If ABCD square ,then the axis of symmetry of AC is
- 16) In Square ABCD , $m(\angle BAC) = \dots\dots\dots$
- 17) ABCD is a parallelogram , if $m(\angle A) = 70^\circ$, then :
 $m(\angle B) = \dots\dots\dots$, $m(\angle C) = \dots\dots\dots$, $m(\angle D) = \dots\dots\dots$
- 18) ABCD is a parallelogram , if $m(\angle A) + m(\angle C) = 200^\circ$, then $m(\angle D) = \dots^\circ$
- 19) ABCD is a parallelogram , if $m(\angle A) = 3 m(\angle B)$, then $m(\angle C) = \dots\dots^\circ$
- 20) in a parallelogram , the diagonals are
- 21) A parallelogram with diagonals are equal called
- 22) A parallelogram with diagonals are perpendicular called
- 23) A parallelogram with diagonals equal and perpendicular called
- 24) A parallelogram with an angle right called
- 25) A parallelogram with sides are equal in length called
- 26) A rectangle , its sides are equal or its diagonals are perpendicular
called
- 27) A Rhombus , its angles are right or its diagonals are equal called
- 28) The measure of each interior angle of equilateral triangle =

Accumulative Questions in Geometry

- 29) The number of altitudes of right angled triangle =
- 30) The number of medians of isosceles triangle =
- 31) The point of intersection of medians of triangle divides each one in the ratio 2 : from vertex , and 3 : from base
- 32) The sum of length of any two sides in triangle the length of third Side.
- if the length of two sides in triangle 3 cm , 5 cm , then the length of third side $\in$] ,[
 - if the length of two sides in triangle 4 cm , 7 cm , then the length of third can be cm (3 , 8 , 11)
 - a triangle with one axis of symmetry and two side lengths 3 cm and 8 cm , then its perimeter =
- 33) In ΔXYZ if $m(\angle X) = 120^\circ$, then the longest side is
- 34) if ΔABC is a right angled triangle at B , then The longest side is
- 35) In the right angled triangle , the length of side opposite to angle with measure 30° is the hypotenuse. (equal , half , twice)
- 36) In the right angled triangle , the length of the hypotenuse is The median drawn from the right vertex. (equal , half , twice)
If ABC is a right angled triangle at B , $AB = 3\text{cm}$, $BC = 4\text{cm}$, then :
- its perimeter = , its area =
 - the length of median drawn from the right vertex = cm
- 37) If XY is axis of symmetry of AB , then $\overline{XA} \dots \overline{XB}$ (= , $\perp$, // , $\equiv$)
and $XY \dots AB$ (= , $\perp$, // , $\equiv$)

Accumulative Questions in Geometry

- 38) if L_1 , L_2 are two straight lines and $L_1 \cap L_2 = \emptyset$, then $L_1 \dots L_2$ ($\perp$, $//$)
- 39) The image of the point (5,-3) By reflection in the x -axis is
- 40) The image of the point (-2 , 1) By reflection in the y -axis is
- 41) The image of the point (5,-3) By reflection in the origin point is
- 42) The image of the point (1,-4) By translation ($x+2$, y) is
- 43) The area of square its perimeter 20 cm =
- 44) The area of square its diagonal length 6 cm =
- 45) The area of rhombus its side length 4 cm and height 3 cm =
- 46) The area of rhombus its diagonals lengths 6cm , 4cm =
- 47) If the lengths of diagonals of a rhombus 12cm , 16cm , then its side length =
- 48) The area of rectangle its width 6 cm and diagonal length 10 cm =
 , and its perimeter =
- 49) The area of parallelogram whose the lengths of two bases 6 cm , 8 cm
 and its smaller height 5 cm =
- 50) ABCD is a parallelogram its area = 36 cm^2 , $E \in \overline{AD}$, then the area of ΔEBC =

Accumulative Questions in Geometry

- 51) The area of trapezium whose middle base length is 7 cm , its height 4 cm =
- 52) The area of trapezium whose lengths of two parallel bases 5 cm, 9 cm ,and its height 3 cm =
- 53) A circle with diameter 7 cm , then its area = , its perimeter =
- 54) A circle with area $9 \pi \text{ cm}^2$, then its radius =
- 55) A circle with circumference $9 \pi \text{ cm}$, then its radius =



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Accumulative Questions in Geometry

0 $\longleftrightarrow$ 90 $\longleftrightarrow$ 180 $\longleftrightarrow$ 360

1) The types of angles (zero, acute , right , obtuse , straight , reflex)

- The type of the angle of measure 75° is ...**acute**
- The type of the angle of measure 200° is ...**reflex**
- The type of the angle of measure 90° is ...**right**
- The type of the angle of measure 180° is ...**straight**
- The type of the angle of measure 95° is ...**obtuse**
- The type of the angle of measure $89^\circ 62'$ is ...**obtuse**

2) The sum of measures of complementary angles = ... **90°** ...

3) The sum of measures of supplementary angles = ... **180°** ...

4) The sum of measures of accumulative angles at a point = ... **360°** ...

- if the measure of an angle is 65° ,then it complements angle **25°** , supplements angle **115°** ,and its reflex angle = **295°**
- if the ratio between two complementary angles is 7 : 11 then the measure of smaller angle = ... **35°** ...

5) If the two adjacent angles are complementary , then the outer sides of them are ...**perpendicular**...

6) If the two adjacent angles are supplementary , then the outer sides of them are ...**on...The same straight line**...

7) Each two vertically opposite angles are ...**equal in measure**...

8) The sum of measures of exterior angles of any polygon = ... **360°** ...

9) The sum of measures of interior angles of triangle = ... **180°** ...

10) The sum of measures of interior angles of a quadrilateral = ... **360°** ...

11) The sum of measures of interior angles of a pentagon = ... **540°** ...

The measure of interior angle of regular pentagon = ... **108°** ...

Accumulative Questions in Geometry

- 12) The sum of measures of interior angles of a hexagon = 720°
The measure of interior angle of regular hexagon = 120°
- 13) The number of diagonals of a quadrilateral 2 , a pentagon 5 ,
a hexagon 9 , a triangle $Zero$
- 14) The number of axes of symmetry of Square has 4 , Equilateral triangle has 3 , Rectangle has 2 , Rhombus has 2 , isosceles triangle has 1 , isosceles trapezium has 1 , trapezium has 0 , Parallelogram has 0 , Scalene triangle has 0 , circle has $infinite$
- 15) If ABCD square, then the axis of symmetry of AC is BD .
- 16) In Square ABCD, $m(\angle BAC) = 45^\circ$.
- 17) ABCD is a parallelogram, if $m(\angle A) = 70^\circ$, then:
 $m(\angle B) = 110^\circ$, $m(\angle C) = 70^\circ$, $m(\angle D) = 110^\circ$
- 18) ABCD is a parallelogram, if $m(\angle A) + m(\angle C) = 200^\circ$, then $m(\angle D) = 80^\circ$
- 19) ABCD is a parallelogram, if $m(\angle A) = 3m(\angle B)$, then $m(\angle C) = 135^\circ$
- 20) in a parallelogram, the diagonals are $bisect$ each other
- 21) A parallelogram with diagonals are equal called $rectangle$
- 22) A parallelogram with diagonals are perpendicular called $rhombus$
- 23) A parallelogram with diagonals equal and perpendicular called $square$
- 24) A parallelogram with an angle right called $rectangle$
- 25) A parallelogram with sides are equal in length called $rhombus$
- 26) A rectangle, its sides are equal or its diagonals are perpendicular called $square$
- 27) A Rhombus, its angles are right or its diagonals are equal called $square$
- 28) The measure of each interior angle of equilateral triangle = 60°

Accumulative Questions in Geometry

- 29) The number of altitudes of right angled triangle = **3**..
- 30) The number of medians of isosceles triangle = **3**..
- 31) The point of intersection of medians of triangle divides each one in the ratio $2 : 1$... from vertex , and $3 : 6$.. from base
- 32) The sum of length of any two sides in triangle **greater Than** the length of third Side.
- if the length of two sides in triangle 3 cm , 5 cm , then the length of third side $\in [2 , 8]$
 - if the length of two sides in triangle 4 cm , 7 cm , then the length of third can be cm (3 , **8** , 11)
 - a triangle with one axis of symmetry and two side lengths 3 cm and 8 cm , then its perimeter = **19 cm**
- 33) In ΔXYZ if $m(\angle X) = 120^\circ$, then the longest side is **YZ**..
- 34) if ΔABC is a right angled triangle at B , then The longest side is **AC**...
- 35) In the right angled triangle , the length of side opposite to angle with measure 30° is the hypotenuse. (equal , half , twice)
- 36) In the right angled triangle , the length of the hypotenuse is The median drawn from the right vertex. (equal , half , twice)
- If ABC is a right angled triangle at B , $AB = 3\text{cm}$, $BC = 4\text{cm}$, then :
- its perimeter = **$3+4+5=12$** , its area = **$\frac{1}{2} \times 3 \times 4 = 6\text{cm}^2$**
 - the length of median drawn from the right vertex = **2.5**. cm
- 37) If XY is axis of symmetry of AB , then $\overline{XA} \dots \overline{XB}$ (= , $\perp$, // , $\equiv$) and XY..... AB (= , $\perp$, // , $\equiv$)

Accumulative Questions in Geometry

- 38) if L_1, L_2 are two straight lines and $L_1 \cap L_2 = \emptyset$, then $L_1 \dots L_2$ ($\perp$, $//$)
- 39) The image of the point (5,-3) By reflection in the x -axis is $..(5,3) ..$
- 40) The image of the point (-2 , 1) By reflection in the y -axis is $..(2,1) ..$
- 41) The image of the point (5,-3) By reflection in the origin point is $..(-5,3) ..$
- 42) The image of the point (1,-4) By translation ($x+2, y$) is $..(3,-4) ..$
- 43) The area of square its perimeter 20 cm = $..5 \times 5 = 5 \times 5 = 25 \text{ cm}^2$
 $S = P \div 4 = 20 \div 4 = 5 \text{ cm}$
- 44) The area of square its diagonal length 6 cm = $.. \frac{1}{2} \times d \times d = \frac{1}{2} \times 6 \times 6 = 18 \text{ cm}^2$
- 45) The area of rhombus its side length 4 cm and height 3 cm = $.. S \times h = 4 \times 3 = 12 \text{ cm}^2$
- 46) The area of rhombus its diagonals lengths 6cm , 4cm = $.. \frac{1}{2} \times d_1 \times d_2 = 12 \text{ cm}^2$
 $A = \frac{1}{2} \times d_1 \times d_2$
- 47) If the lengths of diagonals of a rhombus 12cm , 16cm , then its side length = $..10 \text{ cm}$
- 48) The area of rectangle its width 6 cm and diagonal length 10 cm = $.. l \times w = 6 \times 8 = 48 \text{ cm}^2$
 , and its perimeter = $.. 2 \times (l + w) = 2 \times 14 = 28 \text{ cm}$
- 49) The area of parallelogram whose the lengths of two bases 6 cm , 8 cm and its smaller height 5 cm = $.. b \times h = 8 \times 5 = 40 \text{ cm}^2$
- 50) ABCD is a parallelogram its area = 36 cm^2 , $E \in \overline{AD}$, then the area of $\triangle EBC$ =
 $\frac{1}{2} \times 36 = 18 \text{ cm}^2$



Accumulative Questions in Geometry

51) The area of trapezium whose middle base length is 7 cm , its height 4 cm =

$$A = b \times h = 7 \times 4 = 28 \text{ cm}^2$$

52) The area of trapezium whose lengths of two parallel bases 5 cm, 9 cm ,and its height 3 cm = $\frac{1}{2} \times (b_1 + b_2) \times h = \frac{1}{2} \times 14 \times 3 = 21 \text{ cm}^2$

53) A circle with diameter 7 cm , then its area = $\pi \cdot r^2 = \frac{22}{7} \times 3.5 = 38.5 \text{ cm}^2$
 $r = 3.5$

54) A circle with area $9\pi \text{ cm}^2$, then its radius = $\sqrt{9} = 3 \text{ cm}$

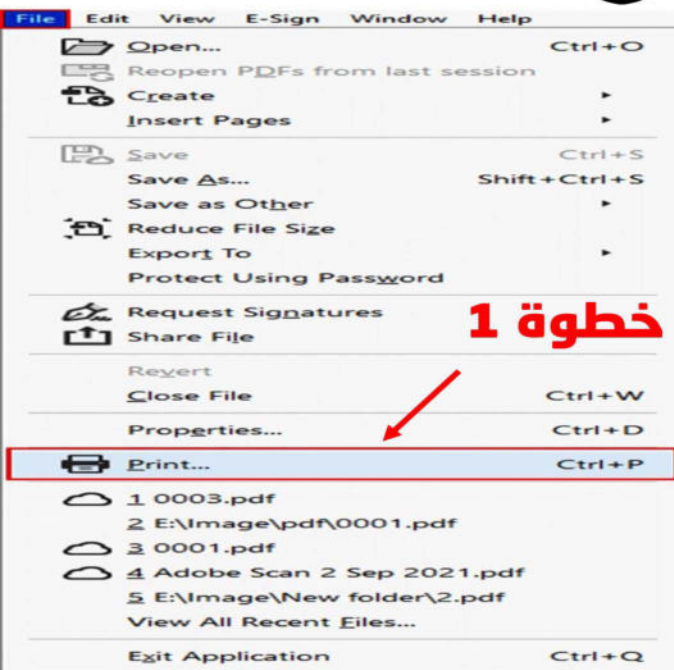
55) A circle with circumference $9\pi \text{ cm}$, then its radius = $\frac{9}{2} = 4.5 \text{ cm}$



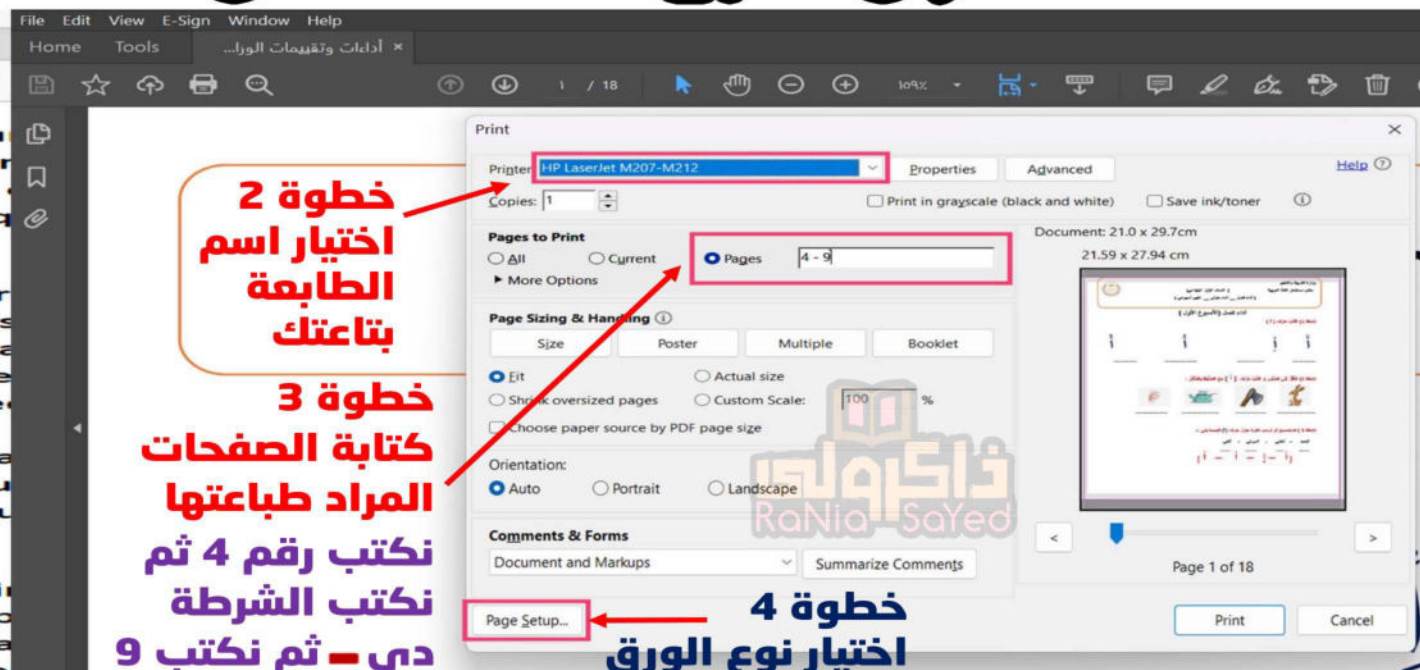
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كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



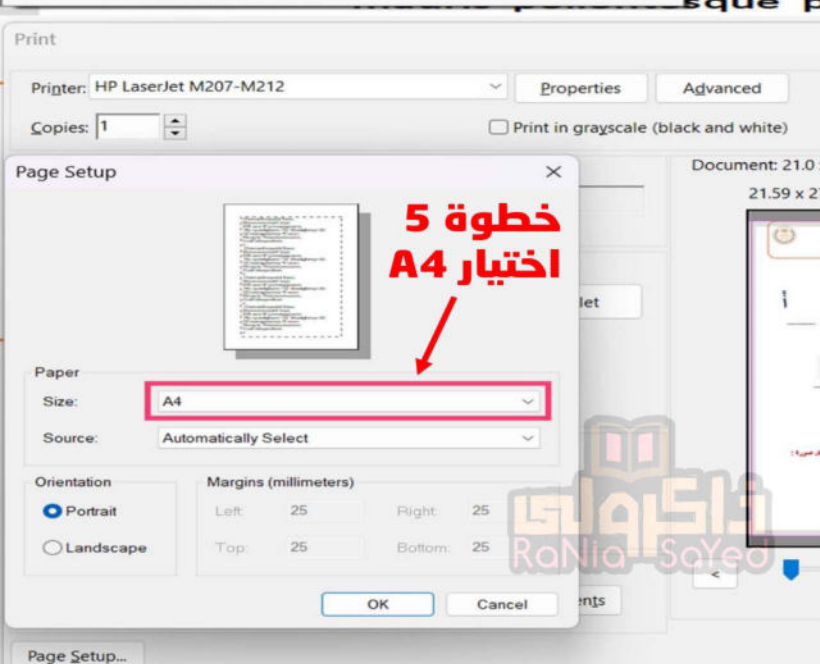
خطوة 1



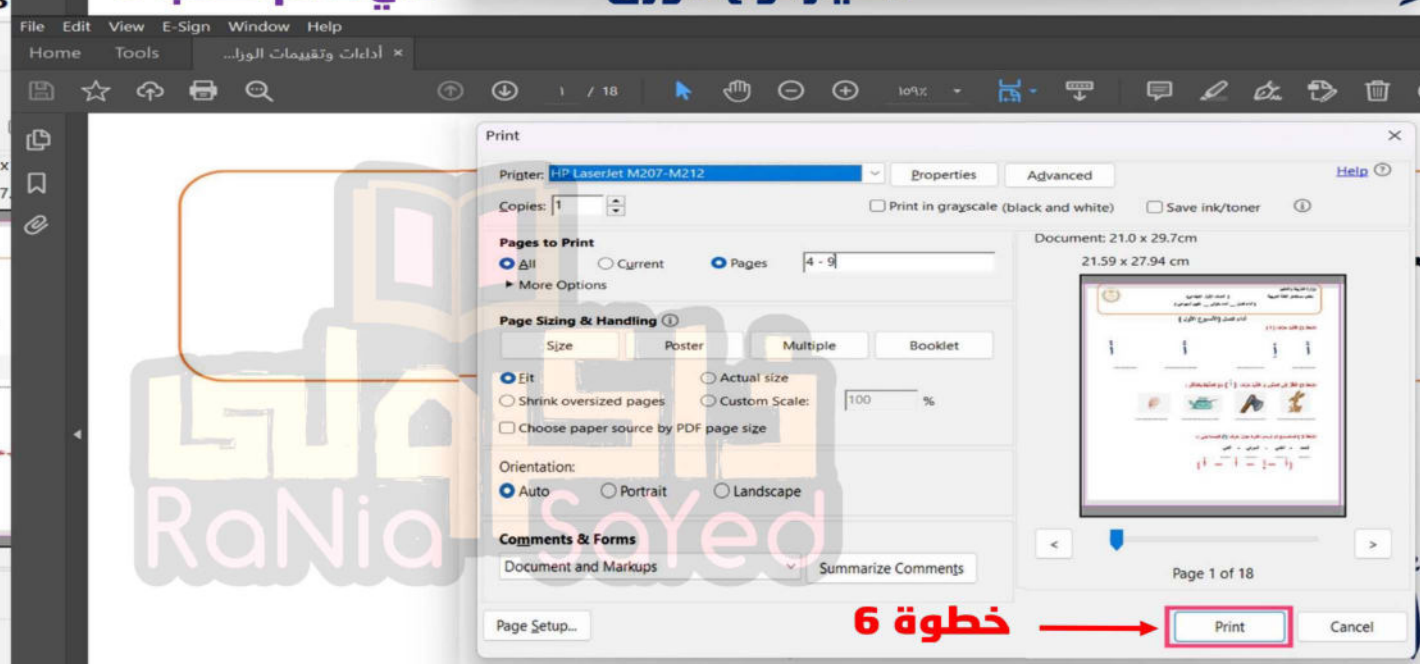
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6